

Writing Technical Documentation for Expert International Audiences

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Tämä opinnäytetyö tutkii niitä edellytyksiä, joilla teknistä dokumentaatiota on mahdollista kirjoittaa englanniksi kansainväliselle yleisölle ilman lokalisointia. Työn keskeinen oletus on, että eri aloilla on olemassa joukko erityisasiantuntijoita, joiden koulutuksen ja kokemuksen voidaan katsoa olevan niin yhdenmukaista kaikkialla maailmassa, että heidän voi olettaa ymmärtävän alansa englanninkielistä teknistä dokumentaatiota. Useat teknisen viestinnän oppaat tarjoavat ohjeita tällaiselle kansainväliselle asiantuntijayleisölle kirjoittamiseen, mutta minkäänlaista standardia ei alalle ole muodostunut.

Työssä tutkitaan, mitä ohjeistusta erityisesti kansainväliselle asiantuntijayleisölle kirjoittamiseen on saatavilla. Ohjeistuksesta muodostetaan synteesi, arviointirunko, jota voidaan käyttää apuna kirjoitettaessa teknistä dokumentaatiota kansainvälisille yleisöille. Työssä myös arvioidaan, onko olemassa oleva ohjeistus tarpeeksi kattavaa ollakseen avuksi teknisille viestijöille. Teoreettisen viitekehyksen muodostavat yhtäältä Gunnarsonin (2009) malli ammatillisesta diskurssista (*professional discourse*) ja sitä muokkaavasta neljästä viitekehyksestä, ja toisaalta Gunnarsonin (2009) ja van Dijkin (2003; 2007) analyysi alakohtaisen erityistiedon (*domain knowledge*) ja erikoistuneen diskurssin (*specialized discourse*) erityispiirteistä.

Työn aineiston muodostavat vuosina 2004 ja 2017 suoritettut lähes identtiset kyselytutkimukset, jotka toteutettiin itsevalikoivina verkkokyselyinä. Tutkimusten samankaltaisuus mahdollistaa myös tulosten pitkittäisanalyysin. Kyselyissä Suomessa toimivat tekniset viestijät arvioivat kahta asiaa: tutkimuksessa koostettua arviointirunkoa ja sen pohjana olevaa lause- ja sanatason yksityiskohtaista ohjeistusta. Vastaajat arvioivat myös, kokevatko he kirjoittavansa teknistä dokumentaatiota kansainväliselle vai kotimaiselle yleisölle, ja onko heillä tarpeeksi laadukasta ohjeistusta kansainvälisille asiantuntijayleisöille kirjoittamiseen. Kyselyt koostuivat monivalintakysymyksistä, ja vastaajien oli mahdollista antaa myös vapaamuotoista palautetta.

Vaikka tulokset eivät ole tilastollisesti edustavia otoskokojen pienuuden vuoksi, voidaan niitä silti pitää suuntaa antavina. Tulokset osoittavat, että on teknisiä viestijöitä, jotka kokevat kirjoittavansa kansainvälisille erityisasiantuntijayleisöille, koska heidän työnantajansa toimivat kansainvälisillä markkinoilla ja tuottavat monimutkaisia teknisiä tuotteita kansainväliseen levitykseen. Tulokset osoittavat kuitenkin myös, että kansainvälisille asiantuntijayleisöille on mahdollista tuottaa teknistä dokumentaatiota englanniksi ainoastaan, kun asiantuntijuus on kapea-alaista, alan koulutus ja prosessit luovat maailmanlaajuisia yhtenäisiä käytäntöjä ja kun englannin kielen ja alakohtaisen terminologian hallinta englannin kielellä on osa ammattitaitoa. Teknisen viestijän on myös tunnettava erityisasiantuntijayleisönsä ammatilliset erityispiirteet ja tiedontarpeet tarkasti. Samalla tulokset osoittavat myös tutkimuksessa muodostetun arviointirungon perustaltaan luotettavaksi ja joistakin puutteista huolimatta hyödylliseksi kirjoittamisen apuvälineeksi. Vastaajien havaitsemat arviointirungon puutteet ja heidän ehdottamansa parannukset tarjoavat useita mahdollisia jatkotutkimuspolkuja.

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1 Introduction

A lot of companies operating in different fields of industry write instructions for their products in English. They serve the whole world with the same English-only guidance without any intent to localize the documentation (St. Amant 2011, 1-2). Based on personal experiences while working in information design in the field of telecommunications, this has become an increasingly common practice for certain types of complex technological products. The technical documentation accompanying these products falls in a grey area between the user guidance for consumer products, and documentation for highly regulated complex systems, such as aviation industry, medical industry, or health care. The consumer products are extensively regulated for consumer protection. As a result, consumers likely receive the accompanying guidance in their own mother tongue. The technical documentation for aviation, health and for example nuclear power generation is, in turn, systematically regulated against loss of life with multiple standards on product and operating safety. These products also typically have their own field-specific controlled languages.

The products that fall in the grey area between the two controlled and regulated fields are typically at least reasonably complex technical products, which are aimed at trained expert use, and are used with little or no modifications across the world. Examples of this kind of “advanced technical equipment and systems” (Gunnarson 2009, 4) that need specialized expertise (*ibid.*, 17) are telecommunications networks, complex machinery such as paper machines, and software for highly specialized use, such as the software to manage mobile operators’ consumer retention or run the stock market back end systems. The user base of these kind of products consists of specialist audiences that are exposed to and often use English in their professional contexts. They also share similar technical training, interests, possibly even organizational roles (Andrews 2001, 11). For that reason, these audiences are commonly accustomed to seeing the terminology of their special field of expertise either fully in English or at least derived from English and can

understand the bulk of the field-specific terminology between companies and geographies (Warren 2001, 164-165). Often the first language of these kind of users may not even have developed the corresponding vocabulary (Uren et al. 1993, 2-3, 35). My professional experience in the field of telecommunications has also shown that these kinds of complex products are so expensive to develop that sufficient revenue to recoup the research and development costs can only be acquired by selling the products globally.

The above specialization together with “the ongoing globalization of professional life” (Gunnarson 2009, 4) mean that the probability of the documentation for a complex technical product being consumed in a single language by people of widely different linguistic and cultural backgrounds has increased considerably since the 1980’s (Trush 1993, 272; Gunnarson 2009, 10-11, 221). Although Trush (1993, 272; 2001, 290) made the observation already in 1993, there has been limited scholarly interest (Geluykens et Pelsmaekers 1999, 5)¹ in writing for global audiences. After an initial peak of attention by authors such as Hoft (1995), Andrews (2001), Stücker (1999), Huckin et Olsen (1991), or Intecom (2003) in the 1990’s and early 2000’s, the more recent developments continue to be periodically discussed on web sites, trade journals and social media for trade professionals². As follows, companies that write documentation in English for global audiences do not have a commonly agreed, systematic set of guidelines to build upon (Hoft 1995, 122). What is available, still chiefly originates in the United States (Hoft 1995, 122; Virtaluoto 2015, 18). Judging by the numerous instructions on avoiding US cultural idioms and

¹ This is also judging by the small number of articles and works on writing for global audiences that have been published since 2004 when major work for this study first took place. Cross-referencing searches conducted in May, June and August 2017 in amazon.com, Google books, amazon.co.uk, ELLIBS, EBSCOHost (Communication and Mass media complete), and ProQuest (Social Science Premium collection) using keywords such as *global audience*, *technical documentation AND global audience*, *technical documentation for global audiences*, *user guidance AND international audience* and their variations repeated the same results comprising of few books and articles.

² See for example *Writing for a Global Audience – 25 Do’s and Don’ts*. <https://www.globalme.net/blog/writing-for-a-global-audience-25-dos-and-donts>. Accessed 26 September 2017, or *Writing for an international audience*. <https://www-01.ibm.com/software/globalization/topics/writing/style.html>. Accessed 25 September 2017.

US English vocabulary³, it is at least implicitly aimed at helping the technical communicators in the US to reach out to the rest of the world. (Hoft 1995, 224-225, 227; Andrews 2001, 196.)

Based on my professional experience, writing technical documentation in English for global audiences seems to be widely practiced. Yet, the instructions are scattered and as just pointed out, chiefly date back to the 1990s. Moreover, several authors on technical writing (Hoft 1995, 4-5, 13-16, 120-121; Conroy 1998, 1; Marnell 2016, 1-3) consider English-only documentation an inadequate solution to be avoided. Instead, English-only documentation should rather be the globalization phase that prepares the documentation for translation into needed languages. (Hoft 1995, 5, 17-20; Rimalower 1999, 175-176; Rubrick.com 1999, intro.htm; Hassell-Corbiell 2001, Globalization.htm; Kohl 2008, 2; St. Amant 2011, 2, 14.) Hoft (1995, 22-24) does lay down the idea of a global product, but reserves it to limited uses such as global signs and symbols. In her opinion (ibid., 25) “globalization in its purest sense does not really occur,” but can be achieved to a limited degree, in which case larger audiences could be reached than with localized products. The more complex the product, the more likely multiple variants are needed. This perceived dichotomy between advice against creating English-only documentation and it being a perceivably common practice woke up my interest in the circumstances and conditions under which it would be possible to write in English for a global audience.

1.1 Research questions and hypotheses

My study has two goals. The first goal is to understand the conditions which enable technical documentation to be written in English for a global audience without considering content localization. Although consumer protection laws ban the approach in several geographies, would

³ See for example <http://techcomm.wikidot.com/chapter:1-ethics-and-rhetoric-cultural-considerations>, <http://daily.unitedlanguagegroup.com/stories/editorials/5-rules-global-english-writing>, http://www.cengage.com/bcomm/book_content/0324375530_lehman/online_career_center/24%20Writing%20for%20an%20International%20Audience.html
All accessed 2 November 2017.

it be possible to serve several geographies with English-only documentation if the audience is a lay audience consisting of regular consumers, and the subject of the guidance is a regular consumer product, such as a mobile device or a car? Or does the global audience need to be more homogenous, sharing expertise and common practices? Can the documentation be in English if the subject of the guidance is a complex technical product, the use of which mandates training (e.g. a paper machine, or a mobile network)? My hypothesis, stemming from my experiences in the field of telecommunications, is that some global audiences can be served with English-only documentation. This is possible if the audience shares several characteristics and properties in terms of professional knowledge, language skills, and shared expertise, and the product is complex enough to need trained experts to operate it rather than a consumer product.

My second goal is to discover whether the instructions that are currently available on writing in English for global audiences are appropriate and useful. I will look at the various rules, suggestions, and conditions on writing specifically for global audiences that are brought forward in various technical writing guidelines. Using the advice, I construct a framework that could serve as a checklist or as a help in assessing what to consider when writing product documentation for a global consumption. I will then ask the technical communication professionals to provide their professional opinions on the validity and relevance of the advice I have summarized and the assessment framework I have constructed. My second hypothesis is that the instructions that are available on writing for global audiences can be used at least as a basis or as a starting point, which the technical communication professionals can subsequently supplement and tailor for their own content creation needs. As constructed, the advice available in the assessment framework is likely to need further additions, clarifications, and explanations.

With the understanding that a lot of companies already create documentation in English for world-wide audiences, I hope that my thesis could have practical applications by increasing the understanding under which conditions and for which types of audiences can English-only

documentation be a globally acceptable solution. I also hope that the framework that I construct could be of use at least as a starting point for professionals in the field for creating more tailored and company-specific guidelines on writing for global audiences.

1.2 Materials and method

The study is based on two sets of data and materials; the primary and secondary data. Table 1 below ties the research questions to the methods used and to the data that the study creates.

Table 1 The research questions, their corresponding methods, and the resulting data

Research questions	Method	Data
Question 1: Under which conditions can technical documentation be created in English for a global audience?	Survey	<ul style="list-style-type: none"> • 2004 survey results • 2017 survey results
Question 2: Are the instructions on writing for global audiences that are currently available appropriate and useful?	<ul style="list-style-type: none"> • Textual analysis • Content analysis • Survey 	Assessment framework, i.e. synthesis of the advice available

1.2.1 Primary data and method: longitudinal data from two surveys

To answer the two research questions, i.e. under which conditions can global audiences be served with English-only documentation, and are the instructions currently available appropriate and useful, carrying out a self-electing web survey (Laaksonen 2013, 1-2, 30) among the technical communication professionals in Finland was deemed to be the best way to gain both quantifiable data and open feedback. A web survey with an open invitation was also deemed to be the most efficient method to reach the maximum number of potential respondents cost-efficiently. A survey was first conducted in 2004 when significant work towards completing this study first took place. That survey was then later followed up with a near-identical survey in 2017. When planning the follow-up survey, care was taken to ensure that the data from the two surveys would be comparable to ensure the opportunity of being able to draw longitudinal comparisons spanning 13 years.

1.2.2 Secondary data: a synopsis of the advice on writing for global audiences

The study also contains a secondary set of data, which is a synopsis of the advice on writing for international audiences. This secondary set of data has been created by textual and content analysis of multiple works containing advice on writing technical documentation for global audiences in English. The aim was to create a synopsis in the form of an assessment framework that gathers the advice into one place in structured format from the level of individual word choices to constructing entire documentation sets.

Because the current study has been conducted in two parts with 13 years in between, some of the secondary materials that were used to construct the framework are getting old. For the most part, the references that were available in 2004 date back to the late 1990's and early 2000's. Only few new references seem to have been published on the topic after 2004, Weiss (2005) and Kohl (2014) being the most comprehensive ones. The lack of new works can in part be explained by the theme having reached certain maturity in the early 2000's - resulting in limited need to revisit the theme. Another plausible explanation is that writing technical documentation for global consumption in English has become a mainstream practice. Advances in the field are made in individual companies. If non-disclosure agreements allow, they seem to be shared in websites, professional social media, and webinars rather than peer-reviewed works.

1.2.3 The theoretical framework

The theoretical framework is drawn from the field of discourse analysis. It is founded on Gunnarson's (2009) and Van Dijk's (2003; 2007) analysis of professional discourse, with emphasis on two key aspects of the professional discourse: first, the central role that domain-specific knowledge has in forming closed groups of professionals with similar sets of specific knowledge within the professional discourse (acquiring the professional knowledge serves as the price of entry), and second, the key role that user guidance has in conveying the domain-specific professional knowledge to the members of those closed groups. Geluykens' and Pelsmaekers'

(1999) analysis of discourse in professional contexts have been used to contrast and complement Gunnarson and Van Dijk.

1.3 Limits of the current study

Creating product documentation for global consumption is a wide issue. Its scope ranges from the choice of words and cultural idioms to globally appropriate color palettes to organizing the contents for fast and easy access the world over. Covering all the aspects in sufficient detail is beyond manageable in a single study. In the current study, the focus is on understanding the conditions that make it possible to write in English to global audiences and assessing the applicability of the constructed framework. Although the framework attempts to introduce the whole scope of writing for international audiences from the choice of individual terms to defining entire documentation sets, its focus is on the sentence level - on the choice of words and terminology as well as constructing sentences that work for global audiences. Although the framework mentions themes such as typeface, globally applicable images, symbols, and color sets, or designing global layouts, their detailed discussion was deemed out of scope for the sake of manageability. In the case of defining entire documentation sets, it was impossible to define to what extent the advice was aimed at writers writing chiefly for audiences in the United States or for global audiences. Finally, the discussion on what constitutes sufficient evidence to trust the presented advice in high and low context cultures when writing for global audiences was also deemed outside the scope of this study. Discussing the theme would have extended the study by a considerable margin with a topic at the fringe of the current study.

1.4 Thesis structure

Chapter 2 lays the theoretical framework by first introducing the two key concepts *technical documentation* and *global expert audiences*. It then ties technical documentation as part of professional discourse, and explains how the shared properties and characteristics of expert audiences are both an integral part of professional discourse and a prerequisite for writing for expert audiences in a single language across the world. Chapter 3 constructs the framework for assessing what to consider when writing for global audiences and explains its intended purpose. Chapter 4 explains the survey method that was chosen for validating the framework and some of the advice that was used to construct the framework. Chapter 4 also explains the survey contents, the technical solutions of the surveys as well as the key updates to the 2017 follow-up survey. Chapter 5, in turn, discusses the findings from the two surveys and draws longitudinal comparisons where possible. Lastly Chapter 6 concludes and summarizes the discussion and proposes several lines of further study.

2 Technical documentation as part of professional discourse

This chapter introduces the key terms and concepts and ties them into the theoretical framework of professional discourse. I begin by defining *technical communication* as an umbrella term. I then proceed to define how *technical documentation* fits within technical communication, and examine some of the key characteristics of technical documentation as well as some of its international and global dimensions. I then proceed to discuss the characteristics and properties of a global homogenous expert audience. I conclude the chapter by discussing what constitutes and shapes professional discourse, and how technical documentation and global expert audiences tie into professional discourse.

2.1 Technical documentation vs. product documentation

Tekom Europe (2017) defines *technical communication* as an umbrella term. It is “the process of defining, creating, and delivering information products for the safe, efficient, and effective use of products”, which can be for example technical systems, software, or services. As its result the process creates communication about products (Tekom 2017). This communication can take shape in the form of *information products*. Several sources (Andrews 2001, 3-4, 7, 89; Gunnarson 2009, 200; Garousi et al. 2015, 664-665) understand these information products to cover the entire information asset that is produced for a product, and call the entire asset *product documentation*. Therefore, product documentation includes marketing materials and all documentation that is produced during the R&D stage in addition to the support materials that are made available upon purchase. In her analysis, Gunnarson (2009, 200) defines product documentation as *product texts* versus the even wider *company texts*, which also include materials about the company, such as advertising, press releases and investor statements.

As defined, product documentation was considered too broad and encompassing to cover in a single study. In my analysis, I focus only on a subset of product documentation, namely those information products that are typically delivered to the customer as part of the product

upon purchase or are made available after sales. The role of these products is to ensure the safe, efficient, and effective use of products as Tekom put it. These kind of information products typically contain technical information about the product and its operation. For that reason, I refer to this subset of product documentation as *technical documentation* and use the term as it is mainly associated according to Transcom (2017): Technical documentation entails the documents and information that are passed on to the public by the manufacturer, such as for example user instructions, operating instructions, servicing instructions and installation manuals. Transcom associates technical documentation with materials that are produced by technical communication professionals and share certain characteristics and legally mandated roles. As follows, Transcom's definition also sets a natural scope for the study. The following six items expand the definition of technical documentation by describing some of its key characteristics and its special role as information about a product or service. At the same time, the items below also highlight the complexity of the content creation process, the unique method of reading, and the extent of legal control over technical documentation across the world, all of which need to be taken into account when writing for global audiences and for global content distribution.

1. Technical documentation has distinct properties and is created collectively

Technical documentation is specific to, and is about an area of expertise (Gunnarson 1992, 3). It contains information about a product or a service (Jones 1996, 27) within that field of expertise. Technical documentation is typically created collectively (Gunnarson 1992, 18; 2009, 22, 197). This group effort may involve all stages of the documentation creation, i.e. content planning, authoring, content review and testing as well as publishing and updating the contents.

Technical documentation also contains vocabulary, text patterns and discourse types that are specific to the written conventions of a field or an area of expertise (Gunnarson 1992, 3). Examples of these text patterns and discourse types are the preference of impersonal style, using catalog style to carry information in places, and the tendency towards faster flow of information and more concentrated text when the text is aimed at professional audiences who share

the expert context, and therefore understand the content without unnecessary elaboration (ibid., 11).

2. Technical documentation is mandated by law

The creation, content and sometimes even the form of the content in technical documentation is mandated by consumer and product safety laws and regulations (Gunnarson 2009, 25). This applies primarily to the information that is made available post-purchase, which needs to cover the safe use of the product. The laws governing the content vary between countries, market areas and trade blocks (SecureDoc 2004, 11-13, 15). For example, the European Union mandates that to sell a consumer product legally, it must be accompanied with documentation that enables users to take the product into use, and use all its features safely (ibid., 11-13, 15). The more the documentation is aimed at global distribution, the higher number of regional laws it needs to comply with (ibid., 24, 40).

3. Technical documentation has specific functional roles

Technical documentation has several functional roles. According to Jones (1996, 27), product documentation defines and describes the product features, and instructs in the correct use of the product. It helps users “to use the product, behave appropriately, or follow the method to achieve the desired result.” (Andrews 2001, 371.) In other words, technical documentation enables users to understand what the product is for, and how to use it correctly.

Technical documentation also informs users how to use the product safely. It warns the users about the possible dangers involved in the misuse of the product, and alerts the users to potential hazards during use (Andrews 2001, 378-379; SecureDoc 2004, 7, 4-15, 28, 30). Product documentation also works as a reference for later use, because the documents are not read to memorize their entire contents, only the parts that describe the information or task instructions that are needed most often are memorized (Reep 1994, 40-41).

Technical documentation also has roles that tie in with brand management, consumer retention, and the overall message the manufacturer wishes to portray about itself. According to Jones (1996, 4), documentation represents the product “in ways consumers find clear, accessible and unthreatening” and therefore find pleasure in using the product. Gunnarson (2009, 197) ties technical documentation back to the wider definition of product

documentation by pointing out that technical documentation also creates and affirms brand image. Using TCEurope's SecureDoc guideline (2004, 47) to summarize the functional roles of technical documentation, technical documentation for a product needs to contain information the following topic areas:

- Description of product features (ibid., 48)
- Product safety (ibid., 50)
- Taking product into use (ibid., 51)
- Correct and safe operation (ibid., 52)
- Troubleshooting errors and faulty operation (ibid., 53)
- Care and maintenance of the product (ibid., 54)
- Obtaining spare parts and accessories (ibid., 55)
- Packing, transporting, and storing the product (ibid., 56)
- Recycling and correct end-of-life care for the product (ibid., 57)

4. Technical documentation is always targeted for known audience

Technical documentation is always written for a specific target audience whose skills, what it already knows about the subject matter, and what are its information needs should be known and understood during the content creation process (Jones 1996, 22, 29; Munger 1998, 10; Rimalower 1999, 175; Redish 2000, 163; SecureDoc 2004, 42-43). According to Rimalower (1999, 175), it is also important to understand what kind of information content the audience expects and how it wants the information delivered so that it can access the needed information quickly. Some of these capabilities (e.g. product expertise and operating procedures) can be shared by the audience globally (Hoft 1995, 25). Hence, technical documentation should always be targeted at the known needs of its researched and defined target audience. It also needs to be updated often enough to continue to meet the needs of those audiences (SecureDoc 2004, 36).

5. Technical documentation is read for a purpose and in snippets

Technical documentation has a distinct purpose and method of reading. Technical documentation is seldom read linearly in its entity, but almost always in pieces and to fulfill a need (Reep 1994, 40-41; Kuure 1995, 125; Schriver 1997, 290-291). Readers check the documentation for specific information, skim and scan the document while pausing at key words and interesting terms while at the same time evaluating the document, its order, and its contents extremely critically (Reep 1994, 40-41; Kuure 1995, 125). Reep (1994, 41) calls this kind of reading

reading-to-do. This kind of reading takes place, for example, when learning to perform a task or to learn about the use of a product. By default, the reader only engages with the content long enough to find the desired piece of information and then dismisses the content (Reep 1994, 40-41). According to Horton (1993, 26), the documentation is also seldom accessed voluntarily, and often as a last resort from which users seek help.

6. Technical documentation is organized for efficient information retrieval

Accessing the support materials takes the user away from the task at hand. Therefore, both the contents and the design of technical documents should be planned to assist readers to the relevant information as quickly and effortlessly as possible. Readers should be able access the information easily, and to put the information into use with the least amount of hindrance to the task they were completing (Reep 1994, 1, 4, 20-23; Kuure 1995, 125). This speed and ease can be achieved by paying attention to the document structure and content organization within a single document or delivery media as well as within the entire documentation asset. The content should have a clear and predictable structure that enables logical information flow, and is consistent and coherent throughout the document (Kohl 2014, 3, 11-12, 18). The documentation should also contain enough metadata (e.g. headings, table of contents, bulleted lists, links) about the contents to help users find the right information fast (Riney 1989, 34). The contents of each document should also be organized by users' tasks instead of e.g. by product features (Riney 1989, 34-35). As follows, the entire document set should be organized unambiguously so that all information can be found under a heading or a topic, where users expect to find it based on skimming the content.

To summarize, technical documentation is consumed to gain information about a product or its features, to perform product tasks safely, and to handle the product correctly. It is delivered or made available as part of the purchase, and parts of the content are mandated by law. The content is consumed in pieces and seldom in a linear order. Therefore, the contents need to be organized for fast and easy information retrieval. These factors need to be accounted for also when writing for global audiences, increasing the complexity of the content creation process.

Having now described technical documentation, I move on to discuss the characteristics of homogenous global expert audiences.

2.2 Shared and not shared properties of global expert audiences

The concept of a homogenous global expert audience is central to the current study. Gunnarson (1992, 18) defines such expert audiences as *communication communities* that involve both speech and written communication. These communication communities can differ in their geographical distances, amount of contact between its members, the shared domain, or the psychological distance between its members. At the same time, these communities are kept together by common norms, attitudes, group identity, and the resulting socialization as a member of such group. (Gunnarson 1992,19.) In today's world, these communities are also increasingly global (Hoft 1995, 1; Gunnarson 2009, 4). Most importantly, global expert audiences share their professional expertise and domain-specific knowledge (Gunnarson 1992, 17). As follows, a global expert audience can share several characteristics in identical-enough manner to constitute a homogenous target audience. To meet the needs of these expert audiences, technical communicators need to understand which properties the expert audience shares globally, and which differences need to be considered in the content creation. The following paragraphs describe some of the characteristics, which can be expected to be shared in close enough format to consider the audience a single homogenous group.

The expert audiences can be expected to share their field of professional expertise. This expertise consists of the audience members' detailed knowledge about the professional domain and its professional context, and of the professional tasks that are carried out within the domain. The professionals also share their domain-specific expertise and skills (Van Dijk 2003, 22, 26-27, 39; Gunnarson 2009, 5-6, 19). Members of such audiences can also be expected to share the field-specific processes and practices (Van Dijk 2003, 26-27, 45-46), which are increasingly uniform across the world in many fields. All the above skills, expertise and domain

understanding are the result of similar technical training, similar organizational roles, and similar professional interests across the world (Andrews 2001, 11, 113) and result in homogenous expert audiences. These shared skills and knowledge form the key set of shared properties that can be used to target the technical documentation for the needs of each expert audience globally.

The members of expert audiences can also be expected to share the discourse conventions within their field domain of expertise (Gunnarson 2009, 7). These conventions include expectations on what information is included in technical documentation and how it is arranged and divided between different media, the style of formal and information communication, and expectations on what shared knowledge everyone is expected to master. Expert audiences also share the domain-specific vocabulary and terminology (Van Dijk 2003, 22; Gunnarson 2009, 5-6) that forms the nucleus of their professional communication. According to Gunnarson (2009, 17), the professional audiences increasingly conduct their professional communication in today's world in their "second, third or fourth language in many contexts, as a result of the increased use of English lingua franca in professional life." Lastly, because the expert audiences share a common professional knowledge, members of such audiences also share their information needs (Hoft 1995, 57), although the scope and extent of exact needs depend on level of expertise and educational background of the individual members. While the shared properties define the members' professional homogeneity and therefore enable the documentation to be targeted at their information needs, the non-shared properties stem from the members' unique personal backgrounds. The following properties should at least be understood, and preferably be accounted for when designing the information content, because they are shared only on regional level or even in smaller groups:

Spelling and vocabulary differences between US and British English (Marnell 2003), and other regional Englishes. Intecom's (2003) guideline recommends preferring the regionally prevalent English if the documentation is aimed at international use in several countries and

choosing US English for global use. Although Marnell (2003) dismisses the Intecom guideline as misguided, because the information may not be available in the audience's preferred variant of English, no better guideline seems to have been developed.

The mother tongue (Hoft 1995, 3) **and the adjoining cultural bias** (Gunnarson 2009, 11, 224) define e.g. how humor is understood, which idioms are understood, and what the cultural taboos and preferences are. Both the technical communicator and the expert using documentation are subject to cultural biases, which they may or may not share. This can at worst result in misunderstood instructions (Hoft 1995, 124-125). To counter, Hoft (1999, 146-147) recommends identifying all the culturally dependent content, and either removing it altogether or working around it – i.e. globalizing the content. However, in doing so, Hoft (ibid., 145) also warns against generalizing too much, because in globalization “we find a strong trend toward generalization. Excessive generalization can lead to myth and stereotyping, among other extremes.” Globalization as a business strategy leads to mass-standardization, losing the focus on the relevant properties of the audience (ibid., 146).

Gunnarson (2009, 224) and Hoft (1995, 2-3) both deemphasize the role of the mother tongue as a not shared property in professional contexts. According to Gunnarson (2009, 224), the harsh business realities and the expense of localization cause a lot of companies that operate globally to offer the company web site or product information in one's mother tongue only “for those prospective customers who either speak the main language of the country or have a mastery of English.” The business realities drive expert and non-expert audiences alike towards content in English.

Although **the cultural model** is not in the scope of the current study, it also differs between high and low context cultures (Thatcher 1999, 183, 194; Quiye 2000, 553). It affects how much detailed information users expect (Hoft 1995, 77-80, 122-3), and which methods of

persuasion enable them to trust the provided advice (Andrews 2001, 240-241). The cultural model also affects the learning style, communication style, and visual and technical literacy of the readers (Hoft 1995, 3). According to Thatcher (2000, 367), a common strategy to overcome the differences in the cultural model is to generalize “the broad cultural patterns from a variety of local patterns” and then identify the differences by comparing the general patterns to another culture, for example that of the technical communicators’. The technical communicators then define a point at which they stop searching for potential differentiating factors between cultures and define that level as the lowest common (=shared) cultural denominator. (Hoft 1999, 145, 148; Qiuye 2000, 553; Thatcher 2000, 367.) Both Hoft (1999, 146) and Thatcher (2000, 367) admit that the approach is not perfect, because it results in the already mentioned generalizations based on a loosely defined group or geographic areas.

To summarize, global expert audiences share properties that are related to their areas of expertise and their professional knowledge. The shared capabilities both assist and enable technical communicators to meet the needs of these audiences globally. The non-shared properties deal with the individuals’ personal properties, and may be shared only on country or regional level. While these properties cannot be entirely negated, a working strategy is to identify the culturally dependent content and globalize it with the lowest shared denominator, or if possible, to remove it entirely. Having now discussed the properties of global expert audiences, I proceed to link technical documentation and the professional audiences with professional discourse.

2.3 Professional discourse

Gunnarson (2009, 5) defines *professional discourse* as the use of the varieties of language “for professional purposes” by different expert groups. Geluykens and Pelsmaekers (1999, 4), in turn define professional discourse as “text and talk in professional contexts” and for professional purposes. Geluykens and Pelsmaekers as well as Gunnarson emphasize the purpose-oriented

nature and the specific professional context of professional discourse. The participants in a professional discourse share and understand the professional context, i.e. they form a community with shared professional knowledge and skills within their field of expertise (Gunnarson 2009, 5-6). Gunnarson (2009, 19, 21) calls these fields *knowledge domains of professional contexts*. Many of these fields within industry share a lot of the practices, processes, procedures, tools, and expertise globally, thus forming more or less homogenous global audiences with experienced professionals. Because the acquired skills and expertise set the professionals apart from professionals in other fields and from laymen, each professional discourse is unique and specific to the knowledge domain or expertise area, although the discourse draws its characteristics and parts of its vocabulary from other nearby domains of similar areas of expertise. The members of professional domains accumulate, create, and evolve these domain-specific skills and knowledge as part of their daily working life. (Geluykens and Pelsmaekers 1999, 7, 11; Gunnarson 2009, 5-6, 16-17, 19, 32.)

In today's globalized working life, professional discourse can be increasingly intercultural, and involve native- and non-native speakers across cultural and geographical boundaries (Geluykens and Pelsmaekers 1999, 5; Gunnarson 2009, 4, 17). For that reason, professional communities need to react to growing globalization and elimination of "borders between states and cultures in today's professional world" (Gunnarson 2009, 10). This in turn creates the foundation for the increasingly global expert audiences.

According to Gunnarson (2009, 10, 20), professional discourse is "situated and dynamic", i.e. it is constantly changing. It creates new knowledge and expertise, and sheds obsolete knowledge as the professions and the surrounding societies change. Because of its situational and domain-specific nature, professional discussion requires shared skills and shared special (= domain-specific) knowledge, which needs to be constantly updated to understand and conduct the field-specific discourse (Geluykens and Pelsmaekers 1999, 7, 9). At the same time,

professional discourse also involves a specialized division of tasks also within the domain of expertise. This further specialization creates pockets of knowledge that are even further specialized within the expertise domains (ibid., 7). These differences in knowledge and the need to constantly update the knowledge to maintain the expertise result in the asymmetrical aspect of the professional discourse (ibid., 7), i.e. the level of expertise and understanding of the shared knowledge varies between individuals within the knowledge domain. Technical documentation, in turn, ties into the professional discourse with its purpose-oriented nature to instruct and educate. It levels out the asymmetries by distributing field-specific information from experts to other experts and to those learning to become experts. Gunnarson (2009, 5) defines the role of technical documentation as “written texts produced by professionals and intended for other professionals with the same or different expertise, for semi-professionals i.e. learners or for non-professionals, i.e. lay people.”

Professional discourse is shaped by four factors, which operate on the societal level, i.e. on the level of society at large. Gunnarson (2009, 8-10) calls these factors frameworks. Because technical documentation is an inherent part of the professional discourse, these frameworks also shape and stipulate the creation of technical documentation. She identifies these frameworks as

- 1) The legal-political framework
- 2) The technical-economical [sic] framework
- 3) The socio-cultural framework
- 4) The linguistic framework (2009, 24-26)

The *legal-political framework* plays the strongest role in stipulating the creation of technical documentation (Hoft 1995, 63-65; Gunnarson 2009, 24). It sets demands for compliancy for the contents (for example mandatory instructions on product disposal), safe use (for example the European Union Machine Directive), for the localization (Poland, Brazil and France among others mandate localized guides for consumer products), and for the used terminology (for example the European Union regulation on how to refer to the CE label in a product compliancy

statement). As follows, these legal demands can be set both on national and supranational levels. The *technical-economical framework* in turn creates new demand for technical documentation through technological advance (Hoft 1995, 62, 67-68; Gunnarson 2009, 25), but also sets new demands by constantly shifting the users' preferred method of accessing the guidance to methods brought about by technological advances. For example, the documentation for the kind of complex technical products that are the subject of this study is nowadays delivered electronically, read online, updated continuously and maybe even viewed on a dedicated YouTube channel rather than the CD-ROM or a binder of a decade ago.

The *socio-cultural framework* provides the ethical and ideological code of society (Gunnarson 2009, 25-26), which defines how openly people in different cultures trust e.g. the content in the user guides. Lastly, the *linguistic framework* defines the language laws and policies of language use (ibid., 26), and creates the ever-shifting common use of language, which is deemed as "everyday language". Typically, technical documentation aims at being written in contemporary everyday language.

Having now discussed what constitutes professional discourse and how Gunnarson's four societal frameworks shape technical documentation, I proceed to conclude the chapter by discussing how the shared knowledge within professional domains forms the homogenous expert audiences. I begin by identifying how the domain-specific knowledge differs from and is a subset of the wider societal knowledge, i.e. knowledge about the society and world around us.

In her model for constructing professional language and discourse, Gunnarson (2009, 20) identifies three distinct levels: 1) *the society*, 2) *domain* and 3) *group*. Each of these levels plays a role in the emergence of language for professional purposes by carrying an increasing depth of professional or domain-specific knowledge, but within a narrower scope. Van Dijk (2003, 21; 2007, 5) largely shares the same concept of different levels or circles of shared knowledge with increasing depth and expertise. According Van Dijk (2003, 23-24), the knowledge on the societal

level is shared by all members of the society. As such the societal knowledge is generic world knowledge that helps us define how we understand the world around us. Van Dijk (2003, 21) also claims that this common ground or world knowledge is a precondition to understanding the meaning of any text or a piece of information. This is because large parts of the meaning of a text are only implied, and need to be deduced from the text “using the world knowledge of the recipient.” (ibid., 21.) For that reason, the deduction presupposes vast amounts of sociocultural knowledge, and any specific knowledge builds upon and uses the common ground.

Knowledge is elemental to understanding specialized (van Dijk), or domain-specific (Gunnarson) discourse (e.g. medicine, education, law, transportation) within each domain. On the domain level, understanding the discourse requires specialized knowledge that the participants possess and share in addition to the world knowledge they all possess. Both Gunnarson (2009, 20) and van Dijk (2003, 22-23) identify the domain level as having its own group-specific knowledge. As the group knowledge sets the members of the domain or a group apart from the rest of the society and from other groups, (van Dijk 2003, 22-23, 27), the group members must have at least some of the relevant knowledge that is more extensive than world knowledge to participate meaningfully in the discourse within the domain. This need is most obvious in the use of technical terminology (ibid., 22). It is not possible to successfully participate in the professional discussion without understanding at least the basics of the related domain-specific terms and concepts (Gunnarson 2009, 7-8, 10, 18-19, 26.). Consequently, new members entering the group need for example explanations of the terms and key concepts. In the context of professional audiences, these kinds of groups can form within a workplace or a country, or among users using a certain piece of software or equipment. Although the members of these professional domains share and understand the globally applicable domain-specific professional language, their jargon may not be understood by everyone (Gunnarson 2009, 7-8, 26). At the same time, this kind of domain-specific knowledge can also refer to knowledge that

can be shared in near-identical form globally, such as for example PRINCE2 or ITIL process models for managing projects. According to van Dijk (2003, 25-27), the types of global expert audiences that are the focus of the current study form domain-specific groups that can share their specialized education, training, knowledge, and practices. These properties can be shared between geographies, even globally.

Lastly, unlike van Dijk who does not make a clear distinction between domain and group levels, Gunnarson (2009, 20, 23, 27) understands the group level as a subset of the professional domain. Such subsets or groups can form for example at workplaces, or within working groups in a workplace. As such, their professional focus is already too narrow for the purposes of the current study.

To summarize the theoretical framework, *professional discourse* is exchange of information (verbal or written) that takes place between members of a specific knowledge domain in a professional context. Becoming a member of any such expert domain entails acquiring the shared expert knowledge and the vocabulary and terminology to carry it. Technical documentation is a means to carry and distribute the domain-specific knowledge. Technical documentation falls into the realm of professional discourse by the nature of its collaborative writing process, by having a purpose to instruct and educate, and because of its intended discursive role. While the societal knowledge differs between regions, languages and cultures, the domain-specific knowledge can essentially be the same the world over. The narrower the domain, the more it is possible to rely on this shared knowledge when creating guidance for expert audiences. Having now set the stage, I proceed to introduce the assessment framework and the materials used in its construction.

3 The Assessment framework

This chapter describes the assessment framework that was constructed using the advice on writing specifically for international audiences. I shall begin by describing the purpose of the assessment framework and why it was constructed. I then proceed to describe the materials that were used to construct the framework first in 2004 and then to update it in 2017 as well as their selection criteria. I shall describe the structure of the framework and present the framework itself before outlining which part of the framework is the focus of this study.

3.1 Purpose of the framework

The intended purpose of the framework is to help technical communication professionals who write in English for global consumption and for the kind of expert audiences discussed in the previous chapter to create technical documentation that better meets the needs of global expert audiences. The framework was constructed with the idea that it could serve as a tool that helps writers understand and assess what to consider when writing for global expert audiences. As such, it describes some of the means to create the kind of guidance that was described in the previous chapter. The central idea of the framework is to present as much of the relevant information scattered in numerous works as could be obtained in a condensed and centralized format so that it could have practical applications. These applications could be for example serving as a checklist of the key issues on writing for global audiences that need to be accounted for in the actual writing process as well as in content planning, or to form a basis on top of which the technical communication professionals can build their own company-specific implementations. At the same time, it could also provide all the references that were used to construct the framework to make accessing further information easier for the professionals, while also highlighting some of the potential pitfalls and disagreements among the authors cited.

3.2 Materials used in constructing the framework

The framework is a synthesis of instructions and guidelines provided by Andrews (2001), Coe (1996), Hoft (1995; 1999), Horn (1995), Huckin and Olsen (1991), Korman (1993), Reep (1994) Riney (1989), Rimalower (1999), Stücker (1999), Trush (1993), and Warren (2001). For detailed references, see Primary sources on page 76. None of the authors above provides a comprehensive set of guidelines that could be used to populate the whole framework and cover all aspects of writing and document design. Consequently, there is unexpectedly little overlap on the advice between the authors. The framework has been supplemented and updated in 2017 with Kohl (2014) and Weiss (2005). Weiss contributes much of the updated and detailed advice on word choice, verb formation, paragraphs and providing syntactic cues such as headings and bulleted lists to make the content more navigable. Harris (2017) became available after the follow-up survey had already been completed. It was used to check the framework one more time against possible recent discoveries. No updates were needed.

In places, it was difficult to assess whether the advice was on good technical writing in general, or specifically aimed at writing for global audiences. In the example below, only the accompanying detailed description provided the international flavor (*italics added*):

Businesspeople are especially susceptible to management fads and the vocabularies associated with them. Management consultants often give new names to old constructs—structured analysis becomes reengineering, for example—creating the illusion of new knowledge. *In messages for international readers, however, these fashionable expressions can be treacherous. Unless these terms are defined in a glossary, international documents should be free of buzzwords.* (Weiss 2005, 56-57.)

Some of the advice on writing for international audiences also predates the idea of targeting the writing specially for global audiences. For example, the advice on creating short and simple sentences is already listed by Young in 1989 (1989, 3, 6, 13), when he advises on using short, crisp sentences, with “only one thought per sentence”. Whenever this kind of advice

with a potential dual role was encountered, it was included in the framework if the author discussed it in an international context.

The following criteria were used to select the advice that was used to construct the framework:

- The advice was available in written, quotable format (Harris' 2017 Kindle video edition is the single exception).
- The author claimed the advice to be specifically on writing for international or global audiences, or the advice could be understood to be on writing for global audiences based on the detailed description.
- The advice could be considered peer reviewed - or could otherwise be considered trustworthy, such as the globalization advice from the IBM Corporation, which has sold its products globally for decades.
- The advice was available through the university library, as an almost complete preview on Google Books, or could be obtained with reasonable expense.
- The advice was contemporary – although noting that the interest peaked in the 1990's and early 2000's, and most of the advice available still dates from that time.

The following materials could not be obtained either because of unavailability or excessive cost:

Lannon and Lannon's *Technical Communication, Global Edition* (2014 and 2016 editions) and Bosley's *Global Contexts: Case Studies in International Technical Communication* (2000) were not available at a reasonable price. Andrews' (ed.) (1996) *The International Dimensions of Technical Communication* (1996) might have contained useful advice. Getting old, it was only available at Amazon.co.uk marketplace, but with no shipping outside the UK.

3.3 The framework structure

The framework is divided into two levels of assessment, *form* and *content*. These levels help focus the attention within a single sentence (the form level), and on issues ranging from a single paragraph to within a single document (the content level). The *form level* operates below the paragraph and describes the advice that affect the form of a single sentence and the way the sentences should be constructed for international audiences. The factors involved are *word choice* and *sentence structure*. The *content level* operates on the levels of *paragraph*, *chapter*, and *individual document*. Factors involving the content of whole documentation sets also operate

on the content level. The current study focuses on individual sentences for three reasons: Firstly, most of the advice available in 2004, and again in 2017 discusses the choice of words and constructing effective sentences for global audiences. Secondly, several authors provided advice on constructing sentences for international audiences. For most of the other parts of the assessment framework, I had to rely on one or two authors only. Thirdly, the selected advice was more explicitly aimed at writing for global audiences than most of the advice on the content level. Table 2 presents the assessment framework as it was updated for the 2017 follow-up survey. Appendix 1 provides a version of the framework with references for each piece of advice, and highlights some of the contrasting viewpoints between authors.

Table 2 The assessment framework

Object of assessment	Factors to pay attention to	Explanation	Focus of analysis
Word choice	<ul style="list-style-type: none"> • Favor commonly used words over learned words and loan words. • Avoid synonyms – at least in places, where they may create ambiguity. • Use technical terms consistently: always use the same term for the same concept. • Avoid culture-dependent words, or words that may be specific to a geographic region. 	Controlling and limiting the word choice is advised, because non-native readers of English may struggle with rare words, verb + preposition combinations, or long multi-word expressions that have no corresponding expression in their mother tongues.	Form (=within a single sentence)
Sentence structure	<ul style="list-style-type: none"> • Avoid sentences with more than ten words. • Avoid sentences with complex structure, such as multiple dependent or relative clauses. • Prefer the word order <i>subject →predicate →object →expression of manner →expression of place →expression of time</i>. • Make sure the referent of a relative pronoun is clear within the sentence. 	Controlling the sentence structure and limiting the sentence length assists non-native readers of English who may find it difficult to understand the relationship between different parts of complex sentences.	Form

Paragraph structure	<ul style="list-style-type: none"> • Make sure there is cohesion between the sentences in a paragraph, i.e. the sentences support each other. • Discuss only one issue per paragraph. • Pay attention to paragraph length. 	Making sure that the information within a paragraph focuses on one issue, and progresses logically helps also non-native readers to focus on the topic being discussed.	Content (= paragraph and above)
Chapter	<ul style="list-style-type: none"> • Make sure the paragraphs follow each other in consistent and logical order within a chapter, and carry the argument. • Pay attention to whether paragraphs can be read individually, or do they need support from each other. 	Making sure that the paragraphs are arranged in a logical order, and can be read individually if needed helps also non-native readers better understand the relationship between the discussed topics.	Content
Organizing the document	<ul style="list-style-type: none"> • Make sure the layout helps readers understand the hierarchy between the different elements of the content so that they can navigate the content more easily. • Make sure the information in a document or on a web site is arranged to support easy understanding also for non-native readers. • Make sure the chapters proceed in logical order. • Provide graphics and/or visual aids (such as more visible headings) to improve navigating the content. • Provide graphics and/or visual aids (such as bullets or callouts) to improve the ease of understanding the content. • Pay attention to where and how the terms are explained. Consider providing a glossary. 	Making sure the document or a web site has a page layout, and enough visual aids (e.g. <i>graphics, margins, space between paragraphs, headings, table of contents</i>) that illustrate the hierarchy between the different parts of the content helps users understand how to navigate the content efficiently.	Content

Having now introduced the goal, content, and structure of the framework, I move on to discuss how feedback on the applicability of the framework and the thinking behind was gathered from the professional community of technical communicators in Finland.

4 Survey as the method of validation

To understand how valid the technical communication professionals perceive the constructed framework and the advice used in its construction, both the framework and select pieces of the advice on the sentence level were exposed to the scrutiny of technical communication professionals. Due to the long gestation period of the study (13 years), this exposure was carried out twice: in 2004 when major work towards completing this study first took place, and again in 2017 to gain an understanding of any potential changes over the passage of time. A third goal was added in 2017 to clarify how essential the technical communication professionals see the role of the global homogenous expert audiences as the key enabler for writing in English for global consumption. This was done to assess the hypothesized importance of both the role of specialized domain knowledge, and the homogenous expert audiences.

This chapter first introduces the chosen method, i.e. a web survey and the technical solutions for the 2004 survey and the near-identical 2017 survey. I then identify the target group as well as the research variables and the background variables. I then proceed to introduce the overarching themes for the survey questions in their 2017 format. I also touch upon the changes that were made to the 2017 survey contents and technical solution based on learnings from the 2004 survey. I conclude the chapter by describing the steps taken to ensure the comparability of the results between the two surveys. Factors that affect the quality of the data are discussed as part of the result analysis.

4.1 The survey method and technical solutions

A self-electing web survey (Laaksonen 2013, 1-2, 30, 31-34) among technical communication professionals in Finland⁴ was deemed to be the best method to gain both quantifiable data and open feedback that could be used to evaluate the validity of the framework. In a self-electing

⁴ Although the surveys were announced predominantly to the technical communicators in Finland, no steps were taken in 2004 or 2017 to prevent responses from abroad. The limitation was not considered necessary.

web survey, the survey is openly advertised among the members of the defined target group, and the potential candidates decide themselves whether they participate or not (Laaksonen 2013, 1-2, 30-31). A web survey with an open invitation was also deemed to be the most efficient method to reach the maximum number of potential respondents cost-efficiently.

In 2004, the survey was carried out as an online survey on the author's University of Tampere homepage. The survey used dynamic HTML pages and Perl scripts to display the survey questions and to process and store the results. When responding, it was possible to provide open feedback for several questions and for the whole survey. Matching the open feedback with a respondent was not possible in order to ensure full anonymity of the responses. In the analysis, it was possible to create dependencies between the answers to any two questions. Several free online survey sites were evaluated for the above capabilities of anonymity and cross-comparisons. Back at the time, none of sites evaluated offered the needed tailoring or technical capabilities. Hence the choice to use a tailored solution. The survey run for eleven weeks until the 15th of August 2004.

Before the follow-up survey in 2017, the feedback of the 2004 survey was analyzed together with the feasibility of re-using the technical solution. As result, a decision was made to use a commercial survey platform and to place less emphasis on the importance of being able to create dependencies for cross-comparison. The importance of the cross-comparison capability was downplayed for two reasons: First, it was expected that there would have been a lot of variation between the answers to the individual questions on the writing advice, and that there would have been notable variation between the responses of managers, writers, and specialists, and between the fields of industry and types of companies. In the end, the 2004 survey results were more uniform than anticipated and the comparisons appeared less fruitful than expected.

The second reason to downplay the cross-comparisons was that the 2004 survey had insufficient mechanisms built in to understand whether actual causality exists between any two correlating answers. While the results indicated that respondents agreed with most of the word and sentence level advice and that the answers correlated between questions as expected, the survey had no mechanisms for understanding what is the cause of the similarity of the answers. To really understand whether the correlations are meaningful and what causes the correlation, the 2004 survey would have needed for example a follow-up session with each respondent to discuss their replies. This was impossible because of the possibility to answer the survey anonymously, which approximately a quarter of the respondents did. To ensure the privacy of the responses also in the follow up survey, the mutual compatibility of the 2004 and 2017 data sets, and to keep the analysis of the results manageable, means to follow up the responses with the respondents were not considered for the 2017 survey.

Unlike in 2004, several free-of-charge online survey platforms that offer easy survey creation with little or no administration and the capability to link questions for comparison were available in 2017. For that reason, a free-of-charge survey platform at freeonlinesurveys.com was used to carry out the survey. The 2017 survey was open for answering between 9th and 21st of June. A temporary paid license bought the needed capability to expand the survey to cover the planned number of questions, to compare the replies between any two questions, and to export the survey results into a MS Excel worksheet.

4.2 Target group and research variables

Technical communication professionals working in the field or in related education in Finland at the time of the surveys were defined as the *target population*⁵ (Lehtonen 2013, 39-40, 229; Heikkilä 2014, 31-32). To gain contrasting views and to receive feedback from the total body of

⁵ In Finnish Lehtonen and Heikkilä use the following terms: Lehtonen: *tavoiteperusjoukko* or *perusotanta*; Heikkilä: *kohdeperusjoukko*.

professionals, and because the number of professionals writing exclusively for global audiences was not known, no attempts were made to limit the target population in any way, e.g. to only those who engage in the actual writing for global audiences. This was done with understanding of the negative impact on the data quality. These impacts are discussed together with the data analysis.

To answer the research questions, the following research variables⁶ (Lehtonen 2013, 47) were identified and tied to the survey questions:

- Do homogenous global expert audiences exist?
- Do the technical communicators feel that they are writing for global audiences?
- What is the technical communicators' level of trust in the constructed assessment framework?
- What is the technical communicators' level of trust in the individual pieces of advice?

The following auxiliary variables⁷ provide background information on the respondents. These variables are used to better understand and evaluate the responses (Lehtonen 2013, 46):

- The availability of guidelines on writing for global audiences
- The respondents' field of business
- The respondents' occupation
- The length of respondents' professional experience
- (In 2004: FTCS (Finnish Technical Communications Society) membership)

Before the surveys were opened for responses, pilot rounds were carried out with 3-5 respondents to test the functionality and contents of the survey. The pilot respondents were technical communication professionals with varied knowledge about the field. The respondents were asked to comment on the understandability of the survey instructions, the way the world-ready approach has been explained, and the way the survey questions were formulated. Based on the pilot answers, corrections and clarifications were made on the instructions, the survey questions, and in 2004 also to the order of the questions. Once the pilot feedback had been handled, the surveys were cleared of the pilot data and launched.

⁶ Lehtonen uses the term *tulosmuuttuja* in Finnish.

⁷ Lehtonen uses the term *apumuuttuja* in Finnish.

4.3 The survey questions

The 2017 survey consisted of six clearly identified sections and 17 questions, six questions fewer than in the 2004 survey. The survey introduction formed the first part of the survey. It explained the survey goals, the structure of the survey, and how privacy of the replies was ensured. The questions were divided into four parts (sections 2-5 of the survey) described below. These parts mirrored the 2004 survey. The 6th and final part gave the respondents a chance to comment on the survey, to provide their email address for a prize raffle, and thanked the recipients.

The first 15 questions investigated either the writing instructions, the assessment framework, or the respondents' professional background and were multiple choice questions. That way the essentially qualitative questions could be quantified for statistical analysis, which also made the longitudinal comparison possible. When comparisons between different questions were needed, the answer choices were implemented using the five-step Likert scale (Laaksonen 2013, 25-26; Heikkilä 2014, 51-52) with the options below:

1. Completely disagree
2. Somewhat disagree
3. Neither agree nor disagree
4. Somewhat agree
5. Completely agree

On both survey rounds, the respondents could skip answering some of the questions. If fewer replies were received to a question, this is highlighted in the subsequent discussion. The questions, their answer choices, and the order in which they appeared are shown for reference in Appendix 2: Questions of the 2004 survey, and in Appendix 3: Questions of the 2017 survey.

Part 2. The perceived target audience

The second part of the survey consisted of five compulsory questions that explored the availability of technical writing instructions in the companies the recipients worked for and whether the recipients felt that they were writing for global audiences or not. The last question probed the importance of a homogenous global expert audience as an enabler for writing in

English for global audiences. It was specifically added in the follow-up survey to assess the chosen theoretical framework.

Part 3. The assessment framework

The third part of the survey consisted of an introduction of the assessment framework, the framework itself, and only one question. Question number six in the survey was identical to the 2004 survey, and investigated if the recipients perceived the framework adequate for analyzing the global approach in a technical document. The answer choices were “Yes”, “Partly” and “No”. If the recipient answered “Partly” or “No”, he or she was asked to provide written comments to outline the perceived shortcomings. This was also the only question in the survey in which providing open feedback was mandatory if a certain choice was selected.

Part 4. The detailed advice on writing for international audiences

Questions 7 through 12 made up the fourth part of the survey. Together with the third part, these questions were the focus of the surveys and examined the recipients’ opinions on the set of instructions on sentence level. This focus included the use of passive voice, word choice, the use of terminology as well as the choice of verbs. The questions in part four were carried out in uniform manner using the five-step Likert scale. The respondents could also skip answering any of these questions. Providing open feedback was only possible at the end of the section.

Part 5. The background questions

The fifth section consisted of three questions that probed the recipients’ professional background, experience in the field, and the type of company they work for against the answers they had provided. In the analysis, these questions were used to see if there are variations between different fields of business and professional roles. These questions were also used to investigate if the respondent’s field of business influenced the perceived availability of technical writing instructions. The questions were the same as in 2004, but some of the answer options

were updated to reflect the 13 years of development in the field. Having now introduced the survey questions, I shall proceed to discuss the changes made to the follow-up survey.

Gunnarson's and Van Dijk's theoretical framework on the factors shaping professional discourse and the central role of expert audiences in possession of domain-specific knowledge as well as the analysis of the 2004 survey feedback prompted four changes in the follow-up survey.

1. Additional focus on the shared properties of a global expert audience

Understanding how to cater for the shared properties of a global expert audience is the key enabler for writing in English for those audiences. While this was the underlying assumption in 2004, the importance of the shared properties was not sufficiently accounted for in the initial survey in the light of Gunnarson (2009, 20) and Van Dijk (2003, 22, 27). Their works were not available at the time of the initial work for this study. In 2017, a question was added to probe whether the professionals agree on the importance of the shared properties of global expert audiences.

2. Overlapping questions were combined

Based on the near-identical results and open comments, three question pairs seemed to overlap. The question pairs below were combined and reworded in the 2017 survey. The new questions were worded so that the results from the follow-up survey are still comparable with the results from the 2004 survey.

- Question on the importance of using *short sentences* and question on the importance of *writing sentences with simple structure* (Questions 6 and 7).
- Question on *avoiding learned words* and question on *using only the most commonly used and familiar words* (Questions 8 and 9)
- Question on *working around verb + preposition combinations if possible* and question on *avoiding long, multiword verbs* (Questions 11 and 12)

3. More choices were provided for the respondents' field of industry

The open feedback indicated that the division of the respondents' field of industry between Information Technology/Telecommunications and other/traditional fields of industry was too coarse. The division also did not reflect the bygone 13 years of diversification and development in the private and public sectors in Finland. New answer choices were added to better reflect the different fields the technical communicators nowadays work in Finland.

4. The question on the FTCS membership was dropped

In the 2004 survey, 96% of the respondents claimed to be members of the Finnish Technical Communications Society, but that number did not really tell anything useful about the respondents. It only suggested that the results can be applied to the society members with a reasonable degree of confidence, and that the high number of society members may explain the high agreement with some of the advice. Back in 2004, most society members worked in the IT sector, which was dominated by the Nokia cluster. Based on my experience, the advice that was publicly available on writing for international audiences (and was used as a reference in the current study) correlated reasonably well with Nokia Networks' company internal writing instructions in effect at the time. In 2017, it continues to be equally difficult as it was in 2004 to estimate the total number of players in the field, and therefore how well the society represents the whole field of technical communication in Finland. Since the 2017 survey was advertised on the society social media channels, the respondents could be expected to have at least an affiliation with the society— making the question redundant.

4.4 Ensuring comparability of the results

Three steps were taken to ensure that the data from the follow-up survey could be compared with the 2004 data:

1. A maximum possible number of the questions were carried over intact. Only those questions where the results showed that they clearly overlapped were combined to simplify the survey. Also, the survey structure and the order of the questions was carried over to the 2017 survey more or less intact.
2. Changes in answer choices were limited to the auxiliary variables. Only answer choices on the respondents' professional background, which were not detailed enough, or the passage of time had rendered obsolete were reworked. These changes are discussed in closer detail in the analysis chapter.
3. Only a limited number of changes were done to the assessment framework. These changes were limited to including the post-2004 developments in the advice available, and to the most prevalent open feedback and improvement suggestions.

Having now described the technical solution as well as having introduced the survey questions and goals, I proceed to discuss the survey results.

5 Results from the two surveys

In the result analysis, only a subset of the survey results is discussed in detail. The focus is on the perceived appropriateness and usefulness of the framework, the possible existence of global audiences, and what differences, changes and developments over time can be read from the two surveys. I begin by discussing the quality of the data and to what extent can the results be considered conclusive. I then proceed to analyze the respondents' professional background. Having thus set the stage, I discuss the respondents perceived target audience and the extent of their trust in the applicability of the constructed framework. I conclude the discussion by summarizing the respondents' comments and development ideas on the framework.

5.1 Data quality, sample sizes and confidence intervals

Before result analysis, it is important to assess the quality of the data and the factors affecting it. The data quality affects how reliably the research questions can be answered and the results be generalized in the target population. In the current study, the chosen survey method and the properties of the target population affect the data quality in three ways: 1) the unknown size of the target population, 2) the selected method creates a selective bias of the respondents, 3) the survey population is subject to attrition. These factors were either controlled during the surveys, or are understood to affect the analysis of the data. The results are discussed accordingly.

5.1.1 Unknown size of the target population and overcoverability

The *target population* in both surveys is the technical communication professionals in Finland. The current size of the population at the time of the surveys could only be estimated. The estimates ranged from a maximum of 700 active professionals in 2004 to 900-1500 active professionals in Finland in 2017. The numbers are based on discussions with society board members during June 2004 and August 2017. A more desirable target population would likely have been only those professionals who actively engage in writing for global audiences in

Finland. This sub-sample would have needed a two-stage survey to first identify the professionals writing for global audiences, and then carrying the survey only among the qualifying professionals in addition to a control group. The need for this approach was not understood in 2004. When planning the follow up survey, longitudinal comparisons of the results were preferred over a better-defined target group. It is also likely that had there been a two-stage survey in 2017, the response rate on the 2nd round would have been low due to the impending holidays, leading to an unsustainably small sample size. For these two reasons, the target population was set and kept as the whole community of professionals. Because the size of the target population is not known, statistical analysis methods that are based on identifying a clearly defined and representative frame population (e.g. the writers described above) within the target population could not be used (Laaksonen 2013, 42) at the expense of the quality of the results.

The large and partly undefinable target population almost certainly results in *overcoverability* (Lehtonen 2013, 42) in the target population. It is possible that the results contain responses from individuals who identify themselves as technical communicators, although their professional role may be quite removed from the writing activities. The overcoverability was addressed in both surveys by the first question. The participants were asked to comment on whether they feel that their company or employer rather than themselves is writing for a global audience. In 2017, the overcoverability was further addressed by question 13, which probed the participants' profession. The respondents could indicate that they have multiple roles within the field (such as writer/manager, tools specialist/writer), some of which can be more removed from the actual writing. To conclude, since neither survey had means to identify and exclude responses from outside Finland and the participants were not selected in any other way beyond advertising the survey through the Finnish Technical Communications Society, the results are best defined as a self-electing sample (Laaksonen 2013, 56).

5.1.2 A selective bias of the respondents

Both the 2004 and 2017 survey results can be understood to contain a bias towards favoring the idea that it is possible to write in English for global audiences. According to Laaksonen (2013, 36), self-selective web-surveys create a bias⁸ in the responses. In the current study, this bias is a result of four factors. First, it is likely that professionals who were already engaged in writing for global audiences, knew other professionals writing for global audiences, or were working in the fields of industry where this kind of writing was likely to take place were more likely to respond the survey than those who felt that they would have little to contribute. Second, the sample sizes in relation to the target population were too small in both surveys (Laaksonen 2013, 36) to reliably represent the full extent of possible variations of opinion in the target population, leading to the bias described above. Third, professionals who are socially active and follow the different media and social media channels of their profession are also more likely to respond self-selecting web-surveys (Laaksonen 2013, 36), thus favoring their opinions. Fourth, the survey results likely do not adequately represent the whole field of technical communicators in Finland. This is particularly likely in the 2004 results. At the time, 85% of the respondents worked in the IT industry, and only 15% in other fields of industry, making the results heavily biased in favor of the industry practices and already emerging international clientele of the IT field. As discussed below in connection with the background variables, the 2017 survey indicates similar if lesser slant. The bias that resulted from the factors above could not be weighted out in the analysis of results, because it was impossible to estimate whether other unknown factors were also contributing to the bias. Lacking a reliable estimate of the size of the target group, it was impossible to estimate the extent of the bias. Comparative data (Laaksonen 2013, 36) from previous surveys of similar nature within the same target population would have been needed to cross-verify the results. This data does not exist.

⁸ Laaksonen (2013:36) uses the Finnish term *tutkimusjoukon valikoitumisesta johtuva harha*.

5.1.3 Attrition

Two kinds of attrition affect the reliability of the results: *Attrition of the target population over time*, and *attrition during answering the survey*. While the attrition over time could not be controlled, steps were taken to minimize attrition during the survey. According to Lehtonen, (2013, 41-42, 50, 99-100), web surveys in general, and longitudinal studies in particular are subject to attrition of the target population. While the 13 years between the two surveys have seen a stable inflow of new technical communicators from academia, professionals retiring, moving abroad, and the industry trend of outsourcing and offshoring technical communication activities combined with the decline of the telecommunications cluster in Finland since 2009 (Virtaluoto 2015, 16; Virtaluoto, Sannin & Engeström 2016, 496-498), have all resulted in practitioners move out of the field and therefore out of the target population. While the total attrition is impossible to estimate due to the number of professionals in technical communication always having been a subject of debate, the halving of society membership from 300 in 2004 to 140 in 2017 serves as an indicator of the extent of erosion. The follow-up survey did not contain a question on whether the respondents had answered the initial 2004 survey. Due to the long passage of time, it is unlikely that any respondent would have remembered having answered the initial survey.

The survey designs in 2004 and 2017 aimed at minimizing attrition during responding the survey in three ways (see Lehtonen 2013, 23): First, the surveys were kept as short as possible. Second, both surveys were broken into logical sections, and the respondents were indicated the total number of sections, the total number of questions, and their progress through the sections. Third, based on the pilot responses, a reliable estimate of how long it would take to answer all the questions was given at the beginning of the surveys.

5.1.4 Sample sizes and overall confidence intervals

In 2004, a total of 71 answers were received on time. In 2017, a total of 23 answers were received before the survey closed. The small sample sizes in both surveys in relation to the estimated target population mean that the results are to be considered as indicative rather than statistically representative estimates (Lehtonen 2013, 36, 190). Tables 3 and 4 below illustrate the confidence interval, i.e. the margin of error in the two surveys at 95% confidence level. The 95% confidence level is commonly used in Finland as the lowest level at which the results are considered statistically applicable (Lehtonen 2013, 71; Heikkilä 2014, 40).

Table 3 Confidence interval at 95% confidence level in 2004 survey

2004 survey Sample size 71	Number of society members	Estimated maximum number of professionals
	300	700
Confidence interval (margin of error) at 50% - 50% split	10%	11%
Confidence interval (margin of error) at 20% - 80% split	8% (8.1%)	8% (8.3%)

Table 4 Confidence interval at 95% confidence level in 2017 survey

2017 survey Sample size 23	Number of society members	Low estimate: Max. number of professionals	High estimate: Max. number of professionals
	140	900	1500
Confidence interval (margin of error) at 50% - 50% split	19%	20% (20,18%)	20% (20,28%)
Confidence interval (margin of error) at 20% - 80% split	15%	16% (16,15%)	16% (16,23%)

Table 3 shows that when applied to either the number of paid society members or the wider estimate of a maximum 700 professionals working in the field in Finland in 2004, the margin of error varies between 8% and 11%. Table 4, in turn indicates that due to the smaller sample size in proportion to the target group, the margin of error in the 2017 survey falls between 15-20%. The margin of error or confidence interval indicates the difference between the highest and lowest percentage between which the actual result would fall within 95% level of confidence if every member of the target population provided an answer. A small sample size increases the margin of error. The error margin also further varies between questions based on the percentage

shares for each answer option. The closer the percentage values are, the higher the margin of error is and vice versa⁹. For this reason, two margins of error are given for reference: The first margin is where the percentages of answers to a “yes or no” question are split evenly or close to 50%-50%. The second margin indicates the confidence level when the difference in percentages is great (20% - 80%). Since these error margins primarily serve to indicate the overall margin of error, further confidence intervals have been calculated for some of the key results below.

The high margin of error resulting from the small sample sizes exceeds the commonly used maximum of 4% error margin on the commonly used 95% confidence level (Heikkilä 2014, 40-41) in data from both surveys. As follows, the results cannot be considered conclusive. In the scope of the current study, the results can however be used to indicate rough differences (Heikkilä 2014, 40), general trends, patterns of development and overall moods among the technical communication professionals in Finland, and are discussed accordingly. At least 200 responses would have been needed for statistically representative results within the paid membership in 2004, and at least 114 responses to reliably apply the results to the society members in 2017. 430 responses would have been needed to apply the results to a population of 1,500 technical communicators¹⁰ In the light of the decreasing participation in voluntary organizations in Finland (Karlsson 2014, 11; Vaarama 2017, 15) and how fast the number of weekly survey respondents trailed off on both rounds despite reminders, these would have been tough numbers to achieve even when keeping the survey open for several months.

5.1.5 Validity and reliability

As per Heikkilä's (2014, 28) guidelines, the results from the two surveys can be considered partly *reliable*, but not *valid*. This is because the method was and is documented and

⁹ To illustrate, if the answer choices are *Yes* and *No*, and 95% of the respondents answer *Yes* and 5% answer *No*, the error margin is considerably smaller than if 51% of the respondents answer *Yes* and 49% answer *No*.

¹⁰ The sample size calculator at <https://www.surveysystem.com/sscalc.htm#one> was used to calculate the error margins at 95% confidence level as well as the amount of responses that would have been needed for statistically representative results. The sample size calculator was accessed on 24-25 October 2017.

implemented in such a way that the surveys could be repeated in nearly identical format between 2004 and 2017, and can be repeated should the need arise. The surveys were also carried out in a systematic manner, and as the ensuing results suggest, measured what they were designed to measure, hence the reliability. Yet, the already discussed small sample sizes and the unknown size of the target population mean that the data is not statistically *valid* (Heikkilä 2014, 28). Limiting the target population to the paid society membership gets the results close to valid, but introduces the difficulty of understanding how well the society membership represents the total body of professionals. Also, lacking data from comparative surveys, neither round contained any means to cross-verify the *honesty of replies*. This cross-verification (Heikkilä 2014, 76, 79) would have been needed for completely reliable results. As such, the replies are taken at their face value. Having now discussed the data quality, I proceed to discuss the results.

5.2 The background variables

In the result analysis, the underlying expectation was that the respondents' profession within the field of technical communication, their employers' field of business, and the extent of their professional experience would affect their answers. Therefore, to facilitate the subsequent comparisons, I begin by discussing the respondents' professional backgrounds. In cases where these background properties introduce interesting differences or may explain answers to individual questions, I highlight those together with the results.

5.2.1 The respondents' professional roles

The respondents' professional role and how far the role is removed from the actual writing was thought to affect the replies through the tasks the respondent was performing and the visibility of the perceived target audiences to the respondent. In 2004, the respondents could choose from four answer choices to indicate their profession:

- *Writer* (editor, designer, senior designer, or equivalent)
- *Manager* (line or project). I am not directly involved in writing, or writing is a lesser part of my job.

- *Specialist* (tools, graphics, localization, coordinator, etc.)
- *None of the above*

Chart 1 shows that almost $\frac{3}{4}$ of the respondents were directly involved in the actual writing process. Counting in the managers who either guided writers, planned their work, or wrote part-time, the percentage of respondents involved in the writing process in some way is close to 90%.

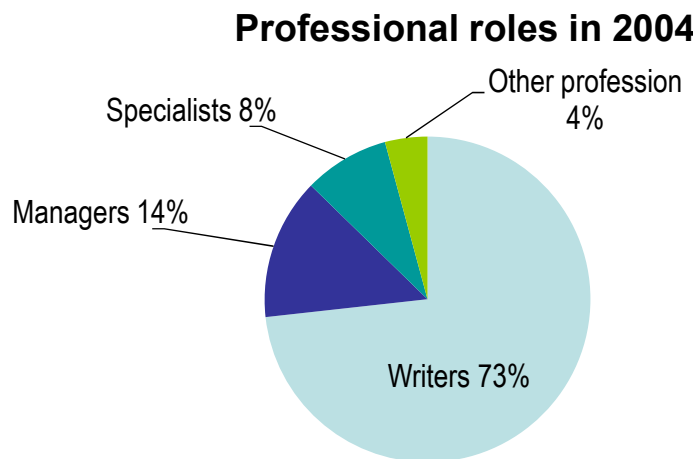


Chart 1 The respondents' professional roles in 2004

Respondents with job titles such as editors, designers, senior designers, or equivalent were all considered writers. Managers could be either of type line or project managers, and it was assumed that they manage the content creation process, but writing may also have been a part of their roles. Only 12% of the respondents identified themselves as specialists in roles supporting the writing activities, or as belonging to none of the groups above. Respondents working as specialists were understood to include such varied roles as documentation or localization tools specialists, graphics designers, localization coordinators and similar professions. Three respondents did not identify themselves fitting any of the categories.

An option to indicate that the respondent has multiple responsibilities was added in the 2017 survey. This was done based on both the 2004 open comments and the assumption that because of the downsizing of the Nokia cluster, the professionals have moved on to work in smaller companies with possibly fewer possibilities for advanced professional specialization, but with demands to master several professional roles. The answer choices were also planned to

include an option for identifying the respondent's profession as academic, but this choice did not activate in the published survey, although it was present in the pilot draft. Hence, the 2017 multiple choice options are as below:

- *Writer* (editor, designer, senior designer, or equivalent)
- *Manager* (line or project). I am not directly involved in writing, or writing is a lesser part of my job.
- *Specialist* (tools, graphics, localization, coordinator, etc.)
- A combination of several roles described above (For example, a manager and a writer)
- *None of the above*

Chart 2 shows that while writers still form 50 % of the respondents in 2017, the assumption that technical communicators in Finland need to master multiple professional roles in 2017 would seem to be justified.

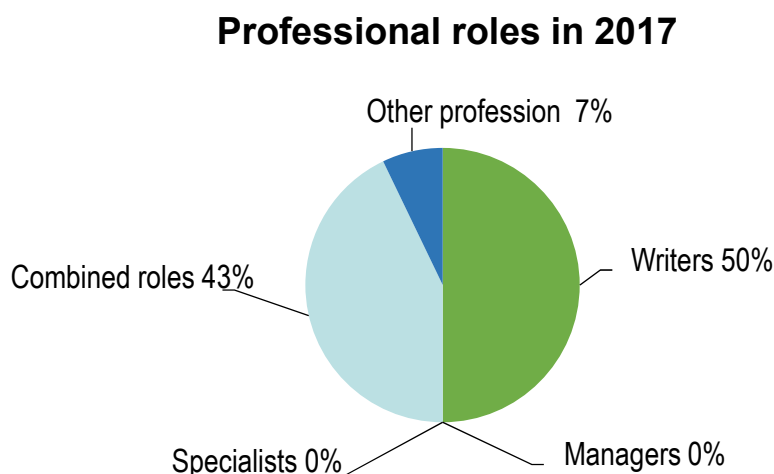


Chart 2 The respondents' professional roles in 2017

The 2017 follow-up study was conducted 11 months after the final documentation people responsible for the last guidance completion and work transfer activities left Microsoft Mobile in July 2016, and while the Nokia Networks' downsizing was once again taking place. The effects of those activities on the technical communication professionals' career paths can therefore be expected to be reflected in the results. At the same time, the unexpectedly high proportion of writers among the respondents can be seen to speak against the perceived death of the technical

writer (Virtaluoto 2015, 56, 58, 63-65). Based on personal experience, technical writing is commonly perceived to be the easiest activity to outsource within the field without major business impact, while keeping the more specialized and experienced managerial and specialist roles closer to home. In 2017, not a single respondent identified themselves as specialists or managers, lending further claims to the idea of professionals needing to occupy multiple roles to survive. Due to the small sample size, it is possible that the responses do not entirely reflect the true variety of professionals in the field. Had the sample size been larger, more respondents might have identified themselves as managers, specialists, or members of academia. At the same time, the high percentage of respondents involved either in the actual writing or managing the content creation activities in both 2004 and 2017 supports the idea that the results can be seen to at least indicate trends among the respondent's professional views on creating content for global audiences, because the respondents have firsthand experience on writing for global audiences.

5.2.2 The respondents' field of business

The respondents' field of business was assumed to play a role in 2004 in such a way that some fields of businesses, such as for example the IT-sector, would be more globally oriented than others, and therefore the perceived target audiences would also be more global. In 2004, four answer choices were available to identify the respondents' field of business:

1. IT (Information technology) or related (*e.g. telecommunications, software, media*)
2. Heavy industry/other older forms of industry (*e.g. building/constructing machinery or equipment, or other industrial products not associated with information technology*)
3. Partner/subcontractor working for IT-industry
4. Partner/subcontractor working for traditional forms of industry

Chart 3 shows that in 2004, most of the respondents worked in the IT sector.

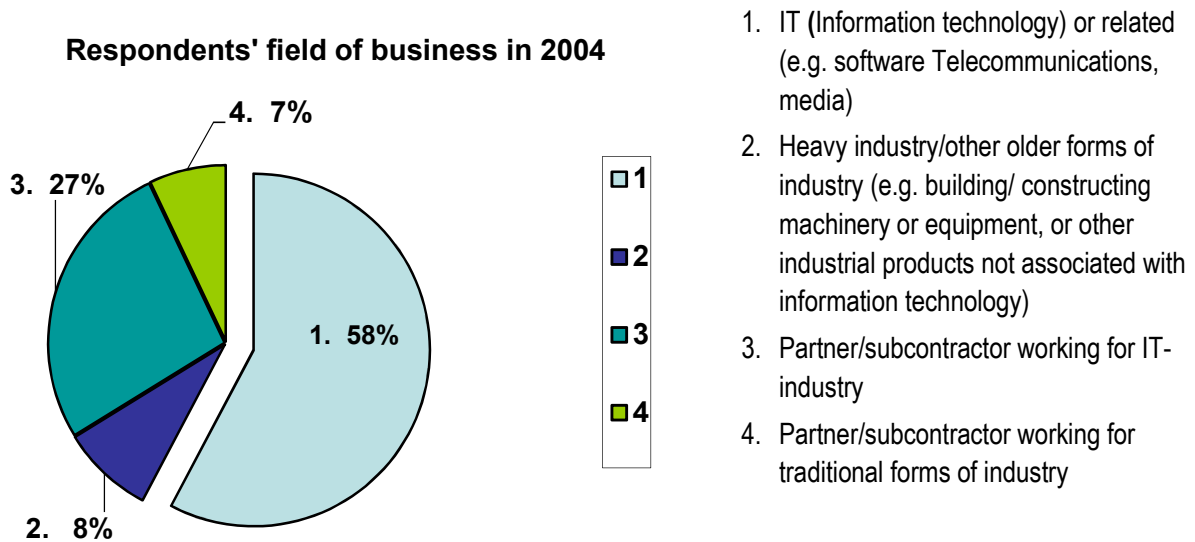


Chart 3 Distribution of respondents by their employer's field of business in 2004

In 2004, almost 85% of the respondents worked either directly in one of the IT companies (option #1), or at one of their partners (option #3). The Nokia-cluster was the dominant player in the IT sector in Finland in 2004. Based on own experiences at the time, the corporation had initiated the documentation outsourcing and offshoring drive a few years previously, but the documentation subcontractors were only at the early stages of their offshoring efforts.

Discussions with the Finnish Technical Communications Society board members at the time strengthened the understanding that a majority of the society members were affiliated with the Nokia cluster. Because of the above reasons, it is more than likely that the internal guidelines and target audience analyses done at Nokia Networks and at Nokia Mobile Phones in the early 2000's, and the resulting views on writing for global audiences are implicit in the majority of the responses from the IT sector.

The open feedback on the 2004 survey indicated that the division of the respondents' field of industry between IT and other/traditional fields of industry was too coarse. Some respondents commented on their products best corresponding with heavy industry, but containing complex IT elements and thus lacking a natural answer choice. To better reflect the 13 years of

diversification and development in the private and public sectors in Finland, the follow-up survey contained the following answer choices and their accompanying explanations:

- Private sector - IT industry (*e.g. telecommunications, software, web, or consumer goods that combine SW and HW, such as fitness bands*)
- Private sector - manufacturing industry (*e.g. hardware, machinery, paper, chemistry, consumer goods*)
- Private sector – services
- Private sector - documentation/localization partner or subcontractor
- Public sector - education
- Public sector - government and related activities (*e.g. state or municipal agencies, public enterprises*)
- Partner/subcontractor working for traditional forms of industry

Chart 4 indicates that the improved granularity was only partly needed. 64% of the respondents still worked in the IT sector or at one of its documentation partners.

Respondents' field of business in 2017

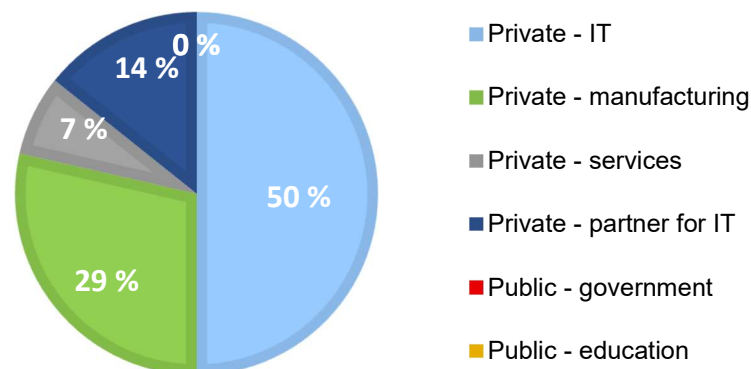


Chart 4 Distribution of respondents by their employer's field of business in 2017

The large share of respondents working in the IT industry in both 2017 and 2004 suggests that the respondents professional background – and consequently also the results - are likely biased towards the IT sector. It is also possible that the manufacturing sector still employs fewer professionals than the IT sector, but this cannot be read from the data. Lacking comparative data on the size of the identified sectors as employers of technical communicators, the potential bias in favor of It sector cannot be weighted out in the analysis.

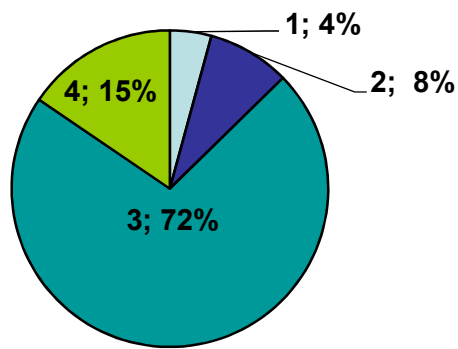
None of the respondents worked in the public sector or education, or at a documentation partner working exclusively for the manufacturing industry. It is possible that no responses were received from those working for a documentation partner that caters only for the manufacturing industry because such partners either do not exist, or are very small. Several of the current documentation big-name partners (e.g. Etteplan Oyj, Citec Oy, Alten Finland, or Lionbridge Technologies [offshored documentation]) cater for all kinds of customers, and have specialty on both software and hardware documentation. The likeliest explanation for the lack of responses from the public sector is the timing of the survey. During the survey, the public-sector employees may already have been operating with holiday staff and focusing on completing pending work before the vacation season.

It is worth noting that unlike in 2004, roughly $\frac{1}{3}$ of the respondents worked in a manufacturing-oriented field of business in 2017. Back in 2004, this was only 8%. This can again be seen to reflect the diminished role of the telecommunications sector as an employer of technical communicators. The increase also indicates that the manufacturing industry now employs a larger share of the technical communication professionals who in turn follow the FTCS social media channels for professional purposes in greater numbers than before. Three respondents opted out from indicating their field of business.

5.2.3 Length of professional experience

Charts 5 and 6 indicate the length of the respondents' professional experience at the time of answering. Professional experience was deemed relevant for the study purposes, because of the assumption that the working years cumulate expertise and widen both the experience and the scope of the professional role.

Professional experience in 2004



I have been working in the field for

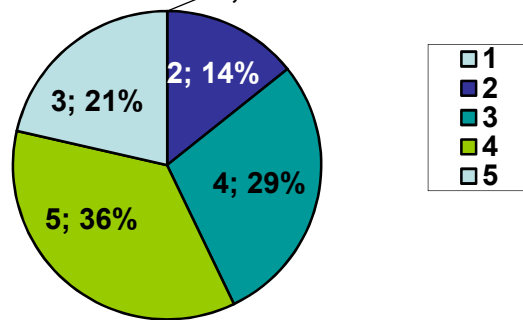
1. Less than one year
2. 1-3 years
3. 3-8 years
4. Over eight years

Chart 5 The number of years the respondents have worked in the field in 2004

In 2004, a clear majority, 72% of the respondents, had been working in the field between 3-8 years. They would already have been employed between 1996 and 2001. These years saw the major influx of new technical communication professionals employed in the Nokia Corporation. Based on recollection, hiring documentation professionals petered out in 2001, leaving other companies and documentation partners responsible for hiring the new entrants. This corroborates the understanding that the 2004 results carry a bias in favor of the practices and policies of the Nokia cluster.

Based on the 2004 open feedback, the answer choice #4 “Over eight years” may not have catered for the longest careers at the time. To better facilitate the longer careers some of the professionals have enjoyed and to cater for the bygone years, the answer choices were reworked in the follow-up survey. The choices now ranged from less than five years of professional experience to more than 20 years. Chart 6 indicates the length of the respondents’ professional experience in 2017.

**Length of professional experience in
2017**



**I have been working in the
field for**

1. Less than five (5) years
2. Less than ten (10) years
3. Less than 15 years
4. Less than 20 years
5. 20+ years

Chart 6 The number of years the respondents have worked in the field in 2017

An interesting finding in the 2017 data is the complete lack of new entrants in the field among the survey respondents. None of the recipients identified themselves as having had worked in the field less than five years. Two of the likeliest explanations for this omission is the small sample size and the selective bias. Less experienced professionals who may also be unsure of their target audience, may have felt they have little to contribute, and thus had a higher threshold to respond.

Discussions among both technical communicators previously employed by the Nokia corporation and among professionals always having been employed in other companies also seem to suggest that in the IT sector, employment of technical communication professionals is becoming somewhat polarized between documentation partners and small to mid-size companies. Both types of employers seem to hire with caution and make the entry into the profession on the IT side more difficult than previously¹¹. Based on the discussions, it is possible to speculate that both these types of employers shun risks and therefore value experienced professionals if they can be employed at reasonable cost. Since the 2017 study had limited means to compare the length of professional experience against the type of employer, because some of

¹¹ Several former Nokia or Microsoft colleagues have new careers in Human Resources in small to mid-size IT companies and at documentation partners. They have admitted in unofficial discussions that they prefer hiring new [documentation] professionals with experience and peer references.

the respondents skipped answering either question¹², and no means to compare the length of experience against the size of company, this remains inconclusive, and could be in the scope of a possible future study.

To summarize the discussion on the professional background, restructuring of the Nokia cluster has had less impact in the professionals' field of business than expected. The majority of the respondents are still employed within the IT sector. The high number of respondents with multiple overlapping professional responsibilities suggests that the professionals as well as the new entrants now work in smaller companies in the IT sector. At the same time, the role of the manufacturing sector is clearly on the increase, and the service sector may also emerge as a new employer for the technical communication professionals. Having now set the stage with the respondents' professional background, I proceed to discuss whether the respondents feel they are writing for global audiences, and whether such audiences exist.

5.3 Writing for a global audience

Questions that probed the technical communication professionals' views and understanding on writing for global audiences were central to the current the study. I first discuss whether the respondents feel that they are writing for a global audience and what impact the respondents' professional background has on their replies. I then proceed to discuss the perceived existence of such global expert audiences. Lastly, I close the section by touching upon the respondents' opinions on the availability of instructions on writing for global audiences.

¹² The data, while inconclusive, suggests that professionals with careers longer than 10 years are split fairly evenly between IT industry ($\frac{1}{3}$), the manufacturing industry ($\frac{1}{3}$) and to lesser extent documentation partners for the IT industry ($\frac{1}{4}$ of the respondents)

5.3.1 Do the respondents feel they are writing for a global audience?

The 2004 and 2017 surveys carried an identical question to understand what kind of audience the respondents perceive as their target audience. The question and the answer choices were as below. It was also possible to provide open feedback.

I feel that my company chiefly writes for

1. Domestic audience, but we may translate the manuals to other languages.
2. Audience in another country or countries, but we localize our documentation.
3. Users all over the world. We write chiefly or exclusively in English.
4. I do not have a clear idea whether my audience is international or not.

Chart 7 compares the perceived target audiences in 2004 and 2017 side by side.

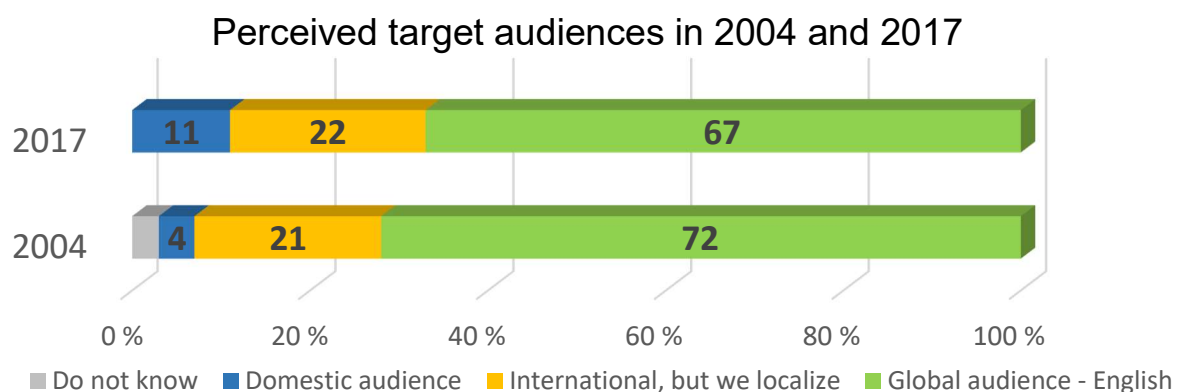


Chart 7 The perceived target audience in 2004 and 2017

The comparison shows that contrary to expectation, the overall percentages have stayed largely similar. In both surveys, approximately 1/5 of the respondents believe that they write for an international audience that is served with localized technical documentation. In the 2017 follow-up survey, the expectation was that there would be a declining trend in writers who are of the opinion that they are writing for a domestic audience or do not know what their target audience is. Similarly, it was expected that a higher percentage of the respondents would write for global audiences than in 2004. While the sample is smaller in 2017, the data would actually seem to contradict the expectation and suggests that fewer respondents now write for global audiences than in 2004, and that writing for domestic audiences is on the increase. The likeliest explanation is the small sample size. Even the response of one person adds several percentage points for each

answer option. This assumption is further supported by the open comments; some of the respondents also commented on the domestic audiences also being served with at least localized versions of the initially internationalized documents.

To understand whether the technical communicators professional role had an impact on the perceived target audience, the respondents' professional roles were compared against their understanding of their perceived target audiences. Chart 8 shows the 2004 comparison.

Perceived target audience by profession 2004

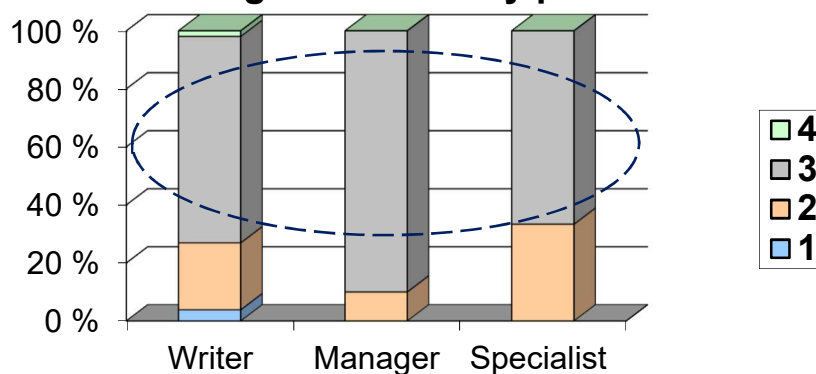


Chart 8 Did the respondents feel that they were writing for a global audience in 2004?

The data illustrates that already in 2004, a significant proportion of the writers, managers and specialists perceived their audiences to be international or in other countries.¹³ Only one writer was of the opinion that s/he is writing predominantly for a domestic audience. Because only a single recipient chose the answer option, the response could not be matched with the respondent's field of industry or any other background variable. The survey scripts prevented this for privacy reasons. Chart 9 shows the similar 2017 comparison.

¹³ Because the discussion on the respondents' professional roles in section 5.2.1 suggested that those who identified themselves with other profession were likely working in academia, their results are omitted in chart 8 and chart 9.

Perceived target audience by profession 2017

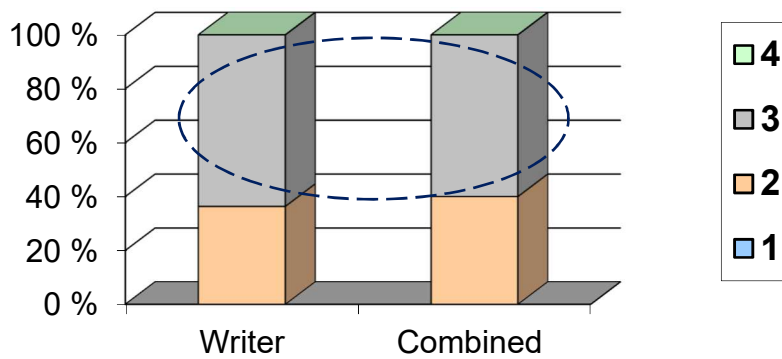


Chart 9 Did the respondents feel that they were writing for a global audience in 2017?

The 2017 data closely mirrors the perceived target audience. A slightly greater share of the writers now feel that they are writing for international audiences who are best served with localized technical documentation. The percentages are near identical for respondents with multiple overlapping professional roles. The data suggest that in 2017, it is slightly less common to write in English for global expert audiences. This finding is, however, in contrast with the high agreement on the existence of global audiences discussed below as well as the data on perceived target audiences when comparing the different fields of business. The likeliest explanation for the discord is once again the small sample size.

It was assumed that in 2017, a higher percentage of respondents in all fields of business would feel that their target audience is global than in 2004. While too few replies were received in 2004 from traditional fields of industry to make interpretations, the data from 13 years ago points that at the time the responses were split near evenly between domestic and international audiences in the manufacturing sector. Chart 10 illustrates the perceived target audience for each field of the private sector in 2017. Apart from public sector (with no responses), which is shown for clarity, only those fields where replies were received from are shown in the chart.

Perceived target audience by field of business in 2017

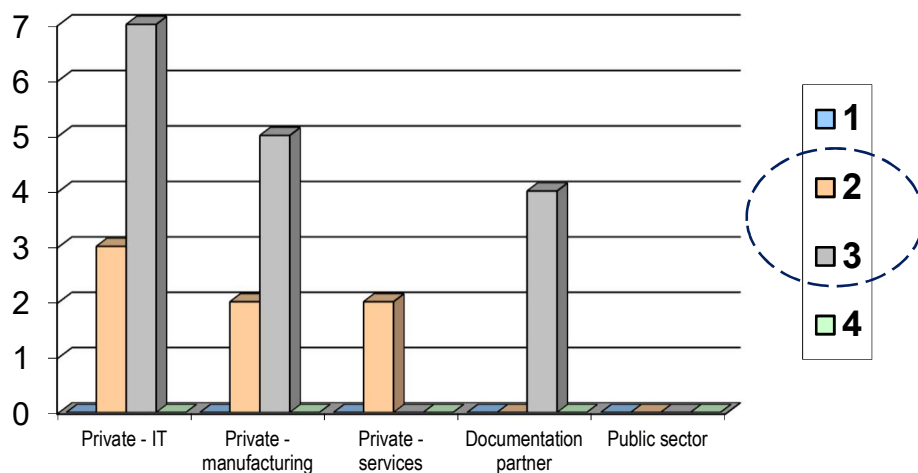


Chart 10 Perceived target audiences in 2017 sorted by field of business

The data suggests that most of the respondents in each sector felt that they were writing for at least international audiences. 16 respondents, which equals to 70% of respondents, identified their target audience as answer choice #3, “Users all over the world. We write chiefly or exclusively in English.”. The rest of the respondents were writing content that was localized (answer choice #2). While responses were not received from sectors, the 2017 data suggests that the initial assumption is valid: Global expert audiences now seem to be common target audiences across the private sector. Back in 2004, only those respondents who worked in the IT sector felt predominantly that they were writing for global audiences.

To further investigate the existence of homogenous global expert audiences, a question was added in the 2017 follow-up survey to probe the technical communicators’ opinions on whether they feel that global expert audiences with shared properties can exist as target audiences. The question with the accompanying explanation of the importance of the shared properties as the key enabler for writing in English was:

The key enablers for writing product documentation only in English for global use are the shared properties of the audience. If the readers share the same expert knowledge and skills, have passed similar certifications, have roughly equal command of English and work with fairly identical software or machinery, they may not benefit from localized product documentation. Do you agree?

To ensure that the full range of possible opinions would be covered, the question was answered on the Likert scale. Being central to the study, it was not possible to skip answering this question. Chart 10 indicates that 70% of the respondents were either fully or partly of the opinion that global expert audiences with shared properties exist.

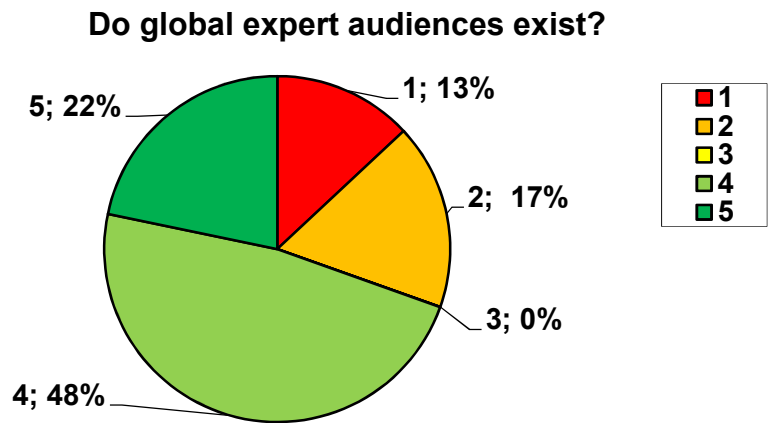
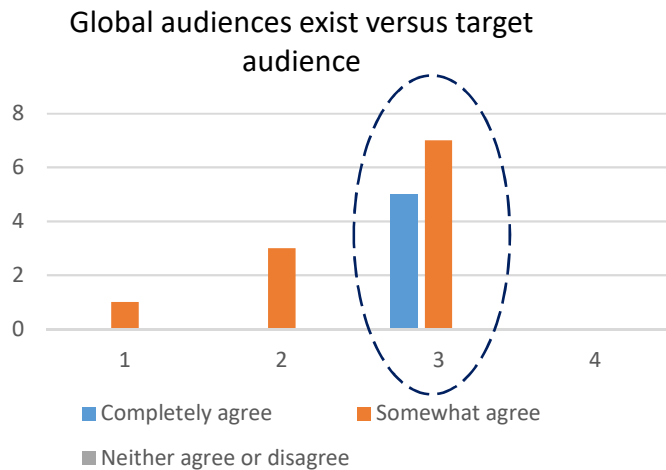


Chart 11 Do homogenous global expert audiences exist

The high agreement would suggest that the research hypothesis that homogenous global expert audiences exist is valid: Technical communication professionals recognize the existence of such target audiences. As follows, it is also possible to plan the information content to cater for the known shared properties and needs of such audiences. To investigate the link between the existence of global expert audiences and global audiences that can be served with English-only documentation, chart 12 compares the answers of those respondents who agreed with the existence of global audiences either fully or partly (answer choices #4 and #5) against their perceived target audiences.

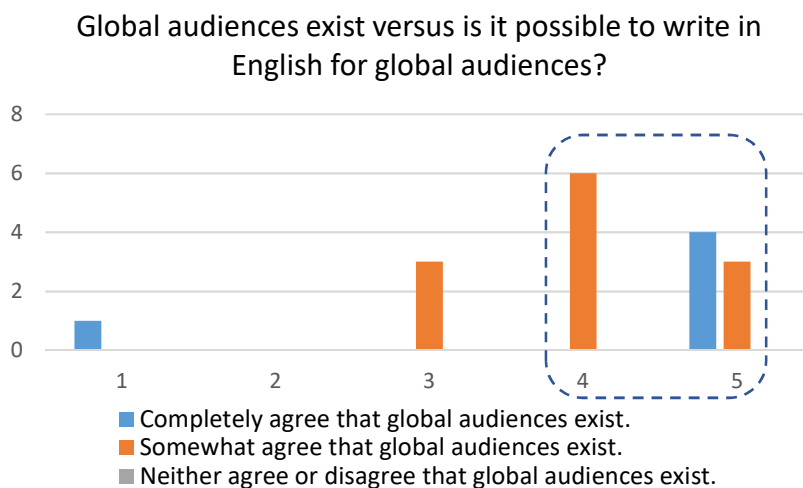


Answer choices

1. Domestic audience, but we may translate the manuals to other languages.
2. Audience in another country or countries, but we localize our documentation.
3. Users all over the world. We write chiefly or exclusively in English.
4. I do not have a clear idea whether my audience is international or not.

Chart 12 The perceived target audiences of those who believe global expert audiences exist

Chart 12 illustrates that those respondents who believe that global audiences exist also feel that they are writing for users all over the world (answer choice #3). Those seven (7) respondents who did not believe that global expert audiences exist, were still predominantly writing for audiences in other countries, but localized their documentation. Lastly, chart 13 compares the responses of those who are of the opinion that global audiences exist against their perception of creating documentation for such audiences in English only.



Is it possible to write in English for global audiences?

1. Completely disagree
2. Somewhat disagree
3. Neither agree nor disagree
4. Somewhat agree
5. Completely agree.

Chart 13 The perceived target audiences of those who believe global expert audiences exist

According to expectation, those professionals who feel that global expert audiences exist were also of the opinion that it is possible to write in English only for such audiences (answer choices

#4 and #5 in Chart 13). The respondents who did not agree, commented primarily on the differences in the audience members' language skills and differences in professional education.

In their open comments, the respondents commented on the English language being the factual lingua franca in some fields of business, especially in the IT sector. One recipient closely mirrored the research hypothesis by commenting that

If you can expect your target _expert_ audience to fill the criteria laid out above, and the subject matter draws heavily from [] our is dominated by English (like IT sector), you can expect your audience to be fully satisfied with English only docs.

Another respondent commented on the possible negative effects of localization of guidance for expert audiences by claiming that “forcing localization actually hindering the understanding of some of the terms”. At the same time, many of the respondents also commented on the existence of expert audiences being very field-specific, and that the command of English likely varies between individuals and geographies, thus making the need to localize the documentation a case-by-case business decision. This varying command of English was also the key argument of those who did not believe that global audiences that can be served with English only documentation. One recipient provided an illustrative example from the oil industry. Although the equipment, operating processes and safety protocols are very similar across the globe, the field-specific working conditions, and the use of less-educated local work force with varying degrees of experience and expertise mandates that the documentation is always available in the local language to ensure safe operation. The key finding in the open comments of those who fully or partly disagree with the existence of global homogenous expert audiences is the importance of knowing and understanding which properties and characteristics the target audience shares and does not share globally. This takes us back to the importance of being able to analyze and understand the target audience. Based on the gained understanding, the decision to write in English or to localize should be made accordingly.

Factors such as the respondent's professional role or length of experience were not seen to play a role in shaping the belief in the existence of global audiences. The differences between the replies of writers and those who have multiple professional roles were also too evenly distributed to have any significance. The same even distribution also applies to those professionals who have worked in the field for less than ten years, or more than 15 years. It is possible that a larger sample size might have introduced increased variation between the replies in terms of both professional experience and professional roles. This, however is unlikely based on the even distribution between all answer options. As follows, understanding that one's target audience is a global expert audience and knowing that one's employer creates products for such audiences seem to be the decisive factors in accepting that global expert audiences exist.

5.3.2 Can any type of audience be served with English-only documentation?

Two further questions probed the technical communicators' opinions on the overall validity of the world-ready approach. The questions investigated what type of audiences and products can be served with English-only documentation across the world. The questions paired lay and expert audiences with consumer products and products for expert use in such a way that the questions probed the opposite sides of the same hypothesis: Is it possible to write English-only guidance for regular consumers and for consumer products, or is an expert audience with specialized expertise operating complex technical products needed? The questions and the Likert scale for answer choices were identical in the 2004 and 2017 surveys. The detailed questions were:

It is possible to write world-ready product documentation for consumer products (such as TVs, VCRs, mobile phones, cookers) aimed at any kind of audience. As follows, carefully internationalized documentation in English can be enough to instruct the user in safe use of the product. Do you agree?

There are products (such as paper machines, telecommunications networks, special medical equipment) that are sold worldwide and are likely to be operated only by trained experts. Because the reader base is both narrow and specialized, carefully internationalized documentation in English can be an adequate solution. Do you agree?

The expectation was that the respondents would agree with the possibility of serving homogenous expert audiences with English-only documentation across the world, and that the respondents would equally disagree with serving lay audiences who use regular consumer products in multiple markets with English-only documentation. As such, the question pair also served as a control question to test the alertness of the respondents and have they understood the survey questions as intended (= validity of the survey, Laaksonen 2013, 21; Heikkilä 2017, 47).

True to expectation, most respondents felt that it is possible to serve global expert audiences with English-only technical documentation. In 2017, 70% of the respondents agreed either fully or in part. In 2004, the agreement was a few percentage points higher at 74%. The number of respondents who disagreed was almost equal on both survey rounds: 17% in 2017 and 16% in 2004. The respondents who are of the opinion that expert audiences can be served with English-only documentation commented on the prevalence of English as the lingua franca in the fields that they write for. One of the respondents even commented that “in the field, you cannot be an expert if you do not understand English well.” Those who felt that it is not possible to serve any kind of expert audiences in English across the world commented on the existence of regions such as the Russian Federation, several of the former Soviet republics, and China (PRC), where even highly-trained experts in a well-defined domain and globally harmonized training in fields such as the IT sector need translated documentation due to their lacking English skills. Further comments were made on fields of industry such as mining and drilling, where several aspects of the expertise on operating complex machinery is acquired through years of manual work in the field and without much formal education past the compulsory stage. The experts are also predominantly local, and may lack advanced English skills. The results from both surveys also showed a clear correlation between the perceived global target audience and belief in the existence of such audiences. Professionals who perceive their target audience to be a global expert audience are also of the opinion that such audiences exist. This was the expected result.

Contrary to expectation, the results on whether it is possible to serve lay audiences with English-only documentation in all markets turned out to be mixed. While the majority of the respondents, 55% in 2004 and again 55% in 2017, were of the opinion that it is not possible to serve lay audiences with user guides that are not localized, 1/3 of the respondents on both survey rounds felt that the approach is entirely valid and regular consumers can be served with guidance in English. This high percentages were not expected. On both survey rounds, slightly less than 15% neither disagreed or agreed. In 2004, three respondents did not provide an answer. While the open comments remained equally mixed, it is likely that the views of those who feel they are writing in English for global audiences are over-represented in the data and thus explain the percentages. It is possible that such professionals almost never need to consider the localization needs or the legal implications of consumer protection laws and language laws that are in effect in most regions. As touched upon in the introduction, lay consumers cannot be served with English-only documentation across the world, because several countries including the Russian Federation, Poland, Brazil, Kazakhstan have laws akin to the Loi Toubon¹⁴ in effect in France. These laws prevent the sale of consumer products that do not have a local language user guide. (SecureDoc 2004, 15-16, 20-21.) It is also possible that those respondents who felt that lay consumers can be served with English-only guidance may have different views on the concept of a consumer and therefore expect lay consumers to be more homogenous and better versed in English than they are. This, however, cannot be inferred from the data.

Those respondents who felt that lay audiences cannot be served with English-only documentation commented on the huge variance of language skills in general and command of English in particular in lay audiences across the world. Several respondents also commented that elderly consumers even in Finland likely lack sufficient command of English altogether, making the approach impossible. Further comments were made on the English-only documentation

¹⁴ <https://globalvis.com/1994/08/the-toubon-law/>. Accessed 16 November 2017.

needing “an excessive use of images” to support the written content, with the assembly instructions for IKEA furniture provided as an example. According to several respondents, heavy use of images would necessitate careful internationalization and globalization of the image contents. In their opinion, too many cultural factors and variables would be at play to make the approach work for all types of consumer products. The result would be confusing instructions that would negate the safe use that was emphasized in the question.

The results on what types of audiences can be served with English-only documentation confirmed the research hypothesis. Lay consumers need localized user guidance, while it can be possible to serve expert audiences with English-only documentation in some fields of industry. At the same time the open comments also strongly suggest that to confidently serve a global expert audience with English-only documentation, technical communicators need to understand the characteristics and properties of their audience, be assured of its homogeneity, and be assured of its sufficient command of English across the world.

5.3.3 Do the professionals have access to advice on writing for global audiences?

To understand how well the potential existence of global audiences has been understood in companies employing technical communication professionals, the surveys contained question on the availability and type of instructions on writing for global audiences. On both survey rounds, the following four answer options were available:

1. We follow guidelines for writing for international audiences.
2. We have guidelines for writing in English, but they do not contain explicit instructions on writing for international audiences.
3. We do not have guidelines for writing in English.
4. There might be instructions on writing for international audiences, but I am not aware of them.

Chart 10 illustrates the similarities between the division of percentages in 2004 and 2017 responses.

Availability of instructions on writing for international audiences

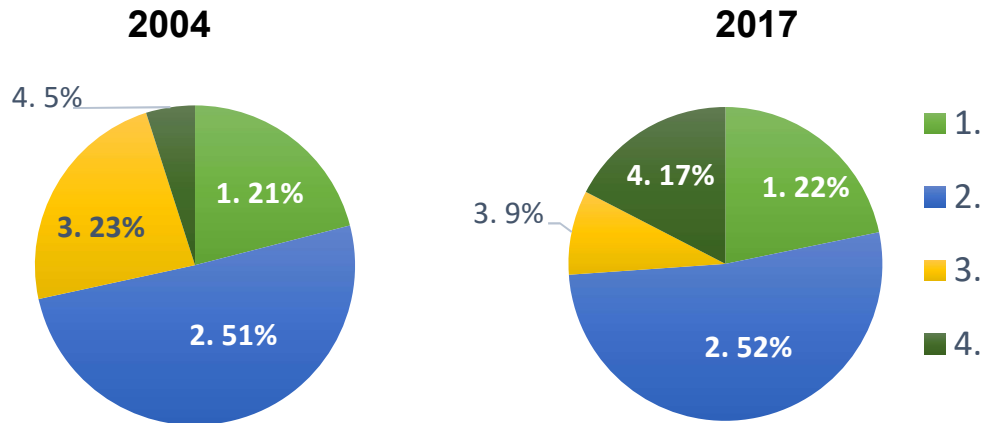


Chart 14 Availability of instructions on writing for global audiences

Only 1/5 of the respondents in 2004 and again in 2017 felt that they have explicit guidelines on writing for global audiences, although most of the respondents in both 2004 and 2017 also felt that they are writing for global audiences. As discussed, the 2017 data also suggests that confidence in the existence of global expert audiences is high. The likeliest explanation is that half of the respondents in both 2004 and 2017 have access to instructions on writing in English in any case, and the instructions are deemed sufficient also for global use.

It is also worth noting that the overall percentages are similar in 2004 and 2017. Approximately 70% of the respondents felt that they have guidelines on writing in English. In 2017, fewer respondents than in 2004 did not have access to any guidelines on writing in English for international use. At the same time, more respondents than in 2004 did not know if their employer has specific writing instructions available on writing in English for global audiences. The open comments did not provide any explanations to this slight, if notable change.

On both survey rounds, there were minor and expected differences of opinion between professions. Those respondents that were more closely involved in the actual writing activities also felt that they have access to instructions on writing in English, while those working in specialist roles more removed from writing tended to be less aware of the instructions. Counter to expectation, the respondents' field of business was not a differentiating factor in the

availability of guidelines. The percentages were similar across all fields of business. The percentages were also similar between professional roles across the fields: The responses from technical writers and their managers in manufacturing oriented industries mirrored the opinions of their counterparts in the IT industry. The majority felt that they have access to guidelines on writing in English for international or global audiences.

Summarizing the discussion on whether it is possible to write in English for global expert audiences and under which conditions, the findings suggest the research hypothesis is true. The professionals in the field operate with the belief that global audiences exist. Their belief is based on knowledge that they write for such audiences, have at least basic guidelines to do so, and know that their employer has an international clientele. At the same time, the shared properties (e.g. command of English) of such audiences vary between the different fields of industry and even between geographies within a single field. It is therefore advisable not to make too far-reaching assumptions without proper analysis of the target audience and its needs. Having now established the existence of homogenous global expert audiences, I move on to discuss the applicability of the framework that was constructed to help with writing for those audiences.

5.4 Applicability of the assessment framework

I first discuss the overall confidence in the assessment framework and contrast that against the respondents' professional characteristics and their perceived target audiences. I then proceed to discuss the results on the select pieces of individual advice. Lastly, I discuss the suggested framework improvements before drawing conclusions.

5.4.1 Overall applicability of the framework

To understand how useful technical communication professionals perceive the constructed assessment framework, the surveys carried a near-identical question on the applicability of the framework for assessment purposes. In 2017, the exact question was "Do you think the [above]

framework is comprehensive enough to help in assessing what factors and individual items should be considered when writing for a global, homogenous expert audience?” The answer choices were “yes”, “no”, and “partly”. It was also possible to provide open feedback. If the respondent answered “no” or “partly” in 2017, providing feedback was mandatory. The hypothesis was that the respondents would not perceive the framework sufficient, and would provide criticism and development ideas accordingly. Chart 15 shows a side-by-side comparison of the 2004 and 2017 responses.

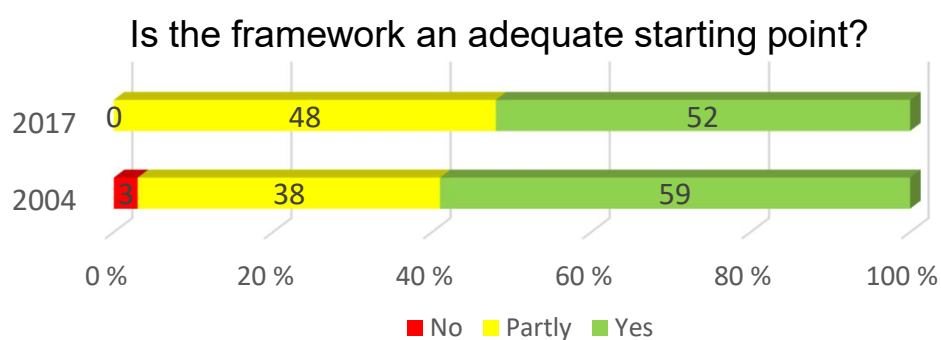


Chart 15 Adequacy of the framework for analysis purposes in percentages

The data indicates that an unexpectedly high percentage of respondents, 52% in 2017 and an even higher 59% in 2004, considered the framework to be sufficient as-is. One possible explanation for the high agreement is answer fatigue (Laaksonen 2013, 42,99; Heikkilä 2017, 42, 47). The respondents know they need to provide additional comments if they answer in a certain way. The open comments on both survey rounds showed a high degree of confidence in the framework, did not fundamentally challenge the framework, and suggested useful additions. Those who did not perceive the framework as useful commented on localization always being the best option to serve international audiences. They also commented on the framework being too generic, not accounting for all relevant factors, and that a lot of the advice in the framework applies to good technical writing in general rather than world-readiness in particular. One respondent cited the advice on the document structure as an example of such general technical writing advice.

Contrary to expectation, neither the length of the respondents' professional experience, nor their field of business created significant differences in their trust in the framework. In 2017, professionals who had been in the field ten years or longer were more prone to trust the framework only partly than respondents with less than ten years of experience. The differences were small, however. The pattern was visible already in the 2004 data. Technical communicators with less than one year of experience in the field trusted the framework completely, the trust subsequently diminishing with mounting professional experience.

When comparing the respondents' opinions on the applicability of the framework against their professional role, writers were more prone to trust the framework than managers. In 2004, 65% of those who identified themselves as writers trusted the framework fully and a further 30% of writers trusted the framework partly. A single respondent comprising the remaining 5% placed no trust in the framework. At the same time, only 25% of managers trusted the framework fully, but 55% of managers found it partly applicable in 2004. In 2017, writers demonstrated a more even 57%-43% split between full and partial trust, while respondents with multiple overlapping professional roles mirrored the 2004 data: Only 29% of respondents with combined roles placed full trust in the framework, but a further 57% found the framework partly useful.

Lack of significant differences is present also when the respondents' trust in the assessment framework is compared against their perceived target audiences. Chart 16 compares the respondents' trust in the framework against their perceived target audiences in 2004 and 2017. The answer options for the target audiences are as before:

1. A domestic audience. If needed, we may translate the manuals to other languages.
- 2. Audiences in another country or countries. We translate or localize our documentation.**
- 3. Audiences in another country or countries. We write chiefly or exclusively in English.**
4. I do not have a clear idea whether my audience is domestic or international.

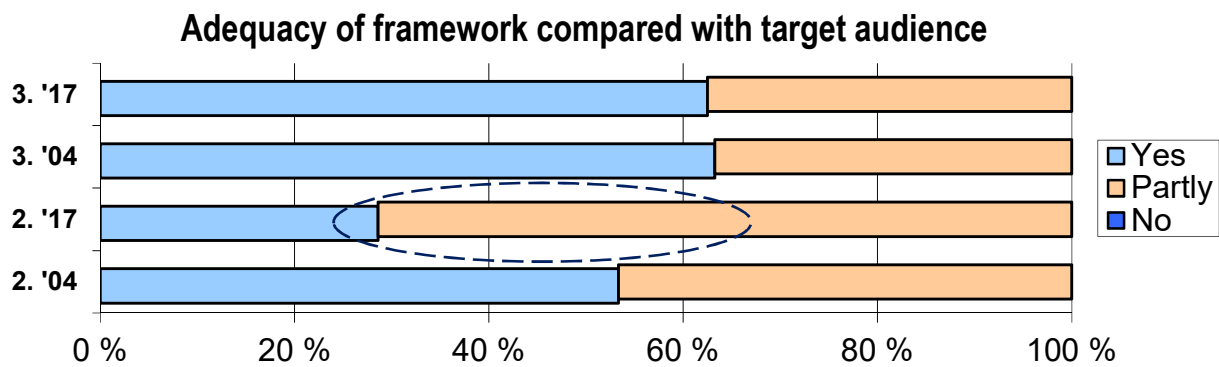


Chart 16 Trust in the framework by target audience in 2004 and 2017

Because only single respondents selected answer options one (1) or four (4) in 2004 or 2017, or both, the results are not representative, and the data has been omitted for clarity. The data indicates that trust in the framework is split evenly between full trust and partial trust when the respondents write documentation that is translated for international audiences (answer choice #2) and when they write English-only documentation for global audiences (answer choice #3). Apart from slightly lower trust in the framework among those respondents in 2017 who expect their content to be localized, there are no significant differences between the two survey rounds. Very few respondents dismissed the framework entirely as a valid starting point. The overall confidence in the entire framework as a useful assessment tool seems to be high. There was also very little variation in the trust based on the respondents' professional background variables. No significant differences stood out.

5.4.2 Usefulness of the detailed advice

Select form-level advice in the assessment framework were singled out for closer study. The questions that assess the usefulness of the advice were identical in the two surveys. It was possible to skip answering one or several of these questions (although very few did), but open feedback was only possible at the end of the survey. The expectation in both 2004 and 2017 was that trust in the individual advice would vary between the individual advice, the advice would be considered incomplete, and that those who were writing for global audiences would be more

critical towards the advice based on their professional experience. Table 5 illustrates the perceived validity of each individual piece of advice in the 2004 and 2017 surveys.

Table 5 Trust in the individual pieces of advice in 2004 and 2017

SURVEY QUESTIONS	2004 DATA					2017 DATA		
	N/A	ANSWER CHOICE		TOTAL % AGREE 2004		ANSWER CHOICE		TOTAL % AGREE 2017
		4	5			4	5	
6. Use short sentences	0	41%	35%	76%		29%	64%	93%
7. Use simple sentences	0	58%	27%	85%				
8. Avoid learned words	0	44%	24%	55%		4%	86%	90%
9. Use familiar words	0	41%	46%	79%				
10. Systematically repeat terms	2	17%	81%	98%		0%	100%	100%
11. Avoid verb-preposition combinations	1	44%	11%	55%		36%	64%	100%
12. Avoid long multiword verbs	1	31%	53%	84%				
13. Use the passive voice	0	27%	62%	89%		29%	71%	100%
14. Avoid the imperative case	0	4%	1%	5%		0%	7%	7%

In the table, answer choices 1-3 have been omitted for clarity and individual responses have been converted to percentages to make comparisons easier.¹⁵ The 2004 column N/A denotes No Answer, i.e. the number of respondents who did not answer the question. In the 2017 survey, none of the respondents skipped answering any of these questions although it was possible. The *Total % agree* column indicates the combined total percentage for answer choices Somewhat agree (4) and Completely agree (5). If more than 80% of the respondents agreed with the advice in 2004 and 100% agreed in 2017, the total percentage is highlighted in green. Similarly, if less than 50% of the respondents agreed with the advice, it is called out in red.

Three interesting findings can be read from the data. First, the overall agreement with some of the individual pieces of advice is very high. When counting together the percentages for answer choices four and five, more than 80% of the respondents agreed with several pieces of the advice in 2004. In 2017, the agreement reached 100% for some pieces of the advice. The

¹⁵ For example: The full Likert scale equals 100% for each question. In 2004, 12 respondents chose answer option 4 for question 10. Since two respondents did not provide an answer, 12 responses out of a total of 69 responses equals 17,4%, which is rounded down to 17%.

second finding counters the expectation that 13 years of creating content for international audiences would have introduced new perspectives and thus increased skepticism towards the advice. The agreement on the individual pieces of advice has changed little between 2004 and 2017: The advice that most of the respondents agreed with in 2004 is the same as in 2017. The likeliest explanation is that although the selected advice was discussed in an international context in the reference materials, it is also generic advice on good technical writing and therefore the respondents would likely recognize similar advice in their company guidelines. Further evidence in favor was provided in the open comments in both 2004 and 2017. Several respondents commented on some of the advice being generic and akin to advice they use at work. The third interesting finding is the high disagreement with the advice on avoiding the imperative case in technical documentation. While authors such as Andrews (2001, 388) and Weiss (2005, 99) recommend using the imperative case with caution, because readers in Asian cultures find it offensive and jarring, only 7% of the respondents in 2017 were of the opinion that the imperative case should be avoided in technical documentation. The 2004 numbers were equally low. This is best explained by standards on creating operating instruction recommending the use of imperative case (SFS-EN 82079-1, 56). Using more polite forms would also introduce unwanted modality and result in unnecessary unclarity. Counter to expectation, the target audience, length of professional experience, or any of the other background variables offered any explanation towards the high agreement. The background variables did not highlight any interesting differences either.

5.4.3 Improvement ideas for the framework

The respondents identified several addressable shortcomings, additions, and improvements in the framework based on their professional experience in technical communication. For that reason, summarizing the feedback was the most rewarding aspect of the current. At the same time, some of the desired improvements cross multiple disciplines and are near impossible to address

without extensive further research. As follows, applying the improvements and introducing an improved version of the framework is subject to future study. The feedback can be grouped into two categories: 1) Framework items that need a detailed explanation or further clarification and 2) Items that are missing from the framework entirely. The following bullets list items that need further clarification in the framework.

- As an overall feedback on the entire framework, each piece of advice would need a mission statement on its purpose as well as the reasoning behind how each item helps write better documentation for international audiences and why it was included in the framework. These should be followed with an example use.
- The advice on the choice of commonest words was too generic. It would need further clarification and examples. Furthermore, the advice against using Latinate or Greek loan words could be contrasted: In some cases, these words can be the commonest ones.
- The advice on creating coherent paragraphs and maintaining consistency across the information content should be presented more prominently in the framework.
- Advice on preferring short and simple sentences would need examples on what kind of sentences do and do not work for global audiences. This is particularly relevant in the light of Weiss' (2005: 69-74) advice on punctuation, which should be used aggressively to call out the relationships between different parts of sentences to assist international audiences. Weiss (2005, 65-68) also advocates avoiding overly simple sentences at the expense of understanding.

Items that are missing from the framework can be grouped into four categories: *Form*, *Content*, *Visuals*, and *Audience*. Form and Content reflect the framework structure discussed in Chapter 3, while Audience and Visuals would add new dimensions in the framework. On the form level, the framework should include advice on selecting a preferred spelling style and choice of words between British and US English, and using that systematically throughout the documentation set (Intecom 2003, 3-4; Marnell 2016, 3-4), although this contradicts the idea of using a single variant of English for global consumption. Intecom (2003, 4) also recommends using US English for global consumption if the above granularity is not possible.

On the content level, the framework would benefit from addressing the omissions outlined below. While the framework cannot be considered complete without these additions, several of the issues below are complex and necessitate research between multiple disciplines.

- Guidelines on the logical order of information for global audiences should be added.
- Guidelines on writing effective procedures for global expert audiences should be added.
- The framework should include guidelines on the optimal maximum length of step-by-step instructions that global expert audiences can process. The framework should also include a set of guidelines on how complex instructions global expert audiences can be expected to understand. The guideline should specifically address the complexity of the structure of instructions. While these asks are valid, it is unlikely that an encompassing guideline can ever be provided for either ask. Providing a generic guideline to consider in the light of the properties of the target audience might be a way to address the issue.
- Guidelines on writing informative headings for global audiences (Weiss 2005, 80-81) should be added.
- Advice on avoiding footnotes and endnotes as well as anaphoric and cataphoric references within content (Weiss 2005, 84-85) should be added in the framework. This would avoid confusing international audiences by forcing them to jump back and forth the documentation content (ibid.).
- Media-sensitive advice and principles (e.g. for online helps, web content, videos) on creating content for international audiences in media other than print and online should be added in the framework.

Feedback from several respondents suggests that in addition to prescriptive content creation guidelines, a new dimension on analyzing and understanding the target audience should be added in the framework. In doing so, at least the suggestions below should be considered.

- The framework should emphasize the importance of understanding what the target audience for the technical documentation is. Several respondents commented on the need to add this advice, but did not provide further details on what would be needed.
- The framework should provide a guideline on assessing what are the relevant characteristics and properties of the target audience, and how to evaluate its level of shared properties and capabilities.
- The framework should also provide help with reconciling the differences between the high and low context models of culture: Advice should be provided on how much contextual information needs to be provided in addition to the step-by-step instructions, and what constitutes sufficient proof or evidence in high and low context cultures. Specifically, advice on how to best cater for both cultural models when the technical

documentation is aimed at global audiences should be added. This is a particularly wide and seemingly unsettled and inconclusive topic.¹⁶

Although adding images, colors, navigation aids and other visual content in technical documentation was not in the scope of the current study, the visual dimension clearly needs to be added in the framework. Although the field is wide and partly outside the domain of technical communication, at least the following omissions should be addressed:

- According to several respondents, the framework needs to address the use and choice of appropriate graphics and colors for global audiences. This would entail at least high-level principles of creating globally applicable images and providing information on globally appropriate color palettes and choices.
- The framework should also provide instructions on globally applicable visual cues and navigation aids that help global audiences navigate the different parts of content in at least the commonest contemporary guidance media.
- Lastly, the framework should also include instructions and examples on creating culture-sensitive icons.

¹⁶ See for example

- Hall E., and Hall M. 1990. *Understanding Cultural Differences*. Yarmouth, ME: Intercultural Press.
- Qiye, Wang. 2000. "A Cross-cultural Comparison of the Use of Graphics in Scientific and Technical Communication." *Technical Communication*, 4th quarter, 553-560.
- Thatcher Barry L. 2000 "Writing Policies and Procedures in a U.S./South American Context." *Technical Communication Quarterly*, fall 2000, Vol. 9 Issue 4, 365-399.
- Thrush, Emily A. 1993. "Bridging the gaps: Technical communication in an international and multicultural society." *Technical Communication Quarterly*, summer 1993, Vol. 2 Issue 3, 271-283.

6 Conclusions

This study was founded on the observation that technical documentation is increasingly produced in English for international distribution without intention to localize its contents, although consumer protection laws in several countries and trade blocks prohibit selling services and consumer goods without localized user instructions. The study had two goals: First to investigate the conditions and types of audiences and types of products that could be served with technical documentation in English. The hypothesis was that if both the target audience and the product fulfill certain conditions in terms of shared expert knowledge, narrowness of the expertise domain, and how complex the product is to operate, the audiences can be served reasonably safely with one technical documentation in English across the world. The second goal was to construct a framework that summarizes the advice on writing for global audiences scattered through various works on creating technical documentation for international audiences, and to assess the validity of the constructed framework by asking technical communication professionals in Finland to comment on its structure and contents. This dual goal can also be considered the greatest shortcoming of the current study. The two goals diversified the effort and introduced unwanted complexity, which was difficult to control at times.

Conducting a self-electing web survey was chosen as the method to probe both the technical communicators' professional opinions on the global audiences and their perceptions on the constructed assessment framework. A survey was first carried out in 2004. A follow-up survey in 2017 allowed longitudinal comparisons. The chosen method worked well in its designed role: Web surveys enabled simple and easy data gathering from a target population that otherwise might have been difficult to reach. Despite a technology change between the initial and follow-up surveys, the initial survey could easily be replicated in near-identical format. The changes in the follow-up survey were prompted by analysis of the initial survey feedback, need to eliminate redundancies and making the survey easier to administer. The survey data and open

feedback also suggest that the questions were understood as they were intended. As such the results can be considered reliable. At the same time, the small sample size in both surveys and the unknown size target population mean that the results cannot be considered statistically valid. In possible future studies, even more effort should be placed into ensuring a statistically valid sample size. The results can, however, be considered to indicate overall development patterns and major differences of opinions among the technical communication professionals.

The results from the two surveys suggest that the research hypothesis is valid. There are technical communication professionals who feel that they are writing for global expert audiences. Their responses suggest that it is possible to write in English for global target audiences when the characteristics and properties of the target audience in terms of its domain-specific knowledge, information needs, skills, and training are both known and homogenous across the world. At the same time, the hypothesis that any global expert audience that is homogenous enough can be served with technical documentation in English was too coarse. Several respondents pointed out counter examples of expert audiences operating sophisticated machinery in a similar manner across the world, but always needing localized documentation due to, for example, lacking language skills. As follows, serving global expert audiences with English-only technical documentation would seem to be possible when the expertise domain is narrow, and when trainings, certifications and identical processes have created uniform information needs, and command of English as well as mastering the domain-specific vocabulary and terminology form part of the expertise. While a clear majority of the respondents in 2017 felt that such global expert audiences exist, the share of global expert audiences receiving technical documentation in English has increased only slightly between 2004 and 2017. At the same time, the percentage of audiences receiving localized technical documentation has remained the same. Due to the small sample size, it was not possible to draw conclusions on the reasons behind the perceived stability.

Trust in the constructed assessment framework turned out to be unexpectedly high on both survey rounds. Two possible explanations for the high agreement is the small sample size and the fact that some of the advice on writing for global audiences overlaps general advice on good technical writing. The results suggest that the framework is perceived applicable and useful, and that there is a clear need for a set of guidelines on what to consider when creating technical documentation only in English for global expert audiences. At the same time, the open comments also suggest that the framework cannot be considered comprehensive enough to meet the need for such guideline at present. The needed improvements focus on four areas: First, adding further prescriptive guidance on form and content level. Second, adding clarifications and examples of use for the individual pieces of advice. Third, adding guidelines on globally acceptable and applicable icons, colors, and images should be added in the framework. Lastly, understanding and analyzing the shared properties, characteristics and expert information needs of the global target audience should also be added in the framework as an entirely new dimension. It is likely that these improvements would enable the assessment framework to truly fulfill its need as a tool that helps technical communication professionals create technical documentation that better meets the needs of global expert audiences.

To conclude, creating technical documentation in English for homogenous global expert audiences without the intention to localize the contents remains both a wide and little researched topic, and the current study has barely scratched the surface. While the results suggest that it is possible to write English only technical documentation for global expert audiences when its shared properties are well understood, the results also suggest that further study is needed at least on designing information content, graphics and visuals for global expert audiences as well as creating guidelines on analyzing the shared properties and characteristics of global expert audiences.

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Appendix 1 The assessment framework with references

Object of assessment	Factors to pay attention to	Explanation	Focus of analysis
Word choice	<ul style="list-style-type: none"> • Favor commonly used words over learned words and loan words. (Weiss 2005, 28; Kohl 2014, 26; Selzer 1983, 79)¹⁷ • Avoid synonyms – at least in places, where they may create ambiguity. (Kohl 2014, 196; Weiss 2005, 19) • Use technical terms consistently: always use the same term for the same concept (Reep 1994, 77; Weiss 2005, 18-19; Kohl 2014, 215, 218-220, 224) • Avoid culture-dependent words, or words that may be specific to a geographic region (Weiss 2005, 56-57). 	Controlling and limiting the word choice is advised, because non-native readers of English may struggle with rare words, verb + preposition combinations (Weiss 2005, 24; Kohl 2014, 36-38, 219; Trush 2001, 295), or long multi-word expressions that have no corresponding expression in their mother tongues (Hoft 1995, 75 – advice against hidden plurals and long noun strings) Weiss 2005, 24-25; Kohl 2014, 60-61). ¹⁸	Form (=below paragraph)
Sentence structure	<ul style="list-style-type: none"> • Avoid sentences with more than ten words. (Hoft 1995, 226; Hassell-Corbiell 2001, Slide Guidelines for Writing Clearly; Weiss 2005, 65; Kohl 2014, 34) • Avoid sentences with complex structure, such as multiple dependent or relative clauses. (Kohl 2014, 40; Weiss 2005, 66-67) • Prefer the word order <i>subject →predicate →object →expression of manner →expression of place →expression of time</i>. (Kohl 2014, 36-37, on the use of verb-centered writing style) 	Controlling the sentence structure and limiting the sentence length assists non-native readers of English who may find it difficult to understand the relationship between different parts of complex sentences. ^{19 20}	Form

¹⁷ Trush, (2001, 292-293), however, counters this that the simple, everyday words of English are idiomatic and thus difficult to master. While her research remains inconclusive and pending further study at the time of writing, she makes a compelling case in favor of using Latinate vocabulary in places to aid clarity.

¹⁸ Interestingly, while Kohl (2014, 2) provides plenty of detailed advice, he also makes the following statement that precedes and contradicts (and as such, to me almost invalidates) his advice: “Because Global English doesn’t impose severe restrictions on the grammatical constructions or terminology that are permitted, it is suitable for all types of technical documentation.”

¹⁹ Selzer (1983, 73-74), however, argued already in 1983 that the advice on favoring short sentences is based on outdated readability formula. According to him, studies conducted already back in the 1980’s showed that instead of mechanical readability, the focus should be on facilitating efficient understanding of the reading content. Words that are common and familiar to the reader help more than limiting the sentence length. According to Selzer (1983, 79), too short sentences lead to choppy style and disconnected ideas, which is counterproductive to the efficiency of understanding.

²⁰ Warren (2001, 162) seconds and sides with the advice, but with the idea that when writing for expert audiences, it is possible to use simpler, more condensed language: “When the information is for the non-peer, the author must use more non-specialized, elaborated language, providing explanations, examples, etc. for the concepts and vocabulary [...] when the authors assume that the readers fully understand all aspects of the sentence, they can use more simple sentences.”

	<ul style="list-style-type: none"> • Make sure the referent of a relative pronoun is clear within the sentence. (Kohl 2014, 85, 98, 105-106) 		
Paragraph structure	<ul style="list-style-type: none"> • Make sure there is cohesion between the sentences in a paragraph, i.e. the sentences support each other. (Reep 1994, 76- 77) • Discuss only one issue per paragraph. (Reep 1994, 70) • Avoid information that is unnecessary to the user (Kohl 2014, 11-12). • Pay attention to paragraph length (Weiss 2005, 85). 	Making sure that the information within a paragraph focuses on one issue, and progresses logically helps also non-native readers to focus on the topic being discussed.	Content (paragraph and above)
Chapter	<ul style="list-style-type: none"> • Make sure the paragraphs follow each other in consistent and logical order within a chapter, and carry the argument. (Reep 1994, 74, 77, 79-80) • Pay attention to whether paragraphs can be read individually, or do they need support from each other. (Reep 1994, 79-80) 	Making sure that the paragraphs are arranged in a logical order, and can be read individually if needed helps also non-native readers better understand the relationship between the discussed topics.	Content
Organizing the document	<ul style="list-style-type: none"> • Make sure the layout helps readers understand the hierarchy between the different elements of the content so that they can navigate the content more easily. (Reep 1994, 78-79; Andrews 2001, 133; Weiss 2005, 78, 81-82) • Make sure the information in a document or on a web site is arranged to support easy understanding also for non-native readers. (Andrews 2001, 395 on readers' different information needs) • Make sure the chapters proceed in logical order. (Reep 1994, 80-86) • Provide graphics and/or visual aids (such as more visible headings) to improve navigating the content. (Reep 1994, 76; Andrews 2001, 394-395; Weiss 2005, 78) • Provide graphics and/or visual aids (such as bullets or callouts) to improve the ease of understanding the content. (Weiss 2005, 78, 86-89, Kohl 2014, 265-268, 274 on syntactic cues) • Pay attention to where and how the terms are explained. Consider providing a glossary. (Andrews 2001, 271, 385; Weiss 2005, 26) 	Making sure the document or a web site has a page layout, and enough visual aids (<i>e.g. graphics, margins, space between paragraphs, headings, table of contents</i>) that illustrate the hierarchy between the different parts of the content helps users understand how to navigate the content efficiently (Andrews 2001, 133-142, 202-203; Kohl 2014, 13, 259-260, 267).	Content

Appendix 2 Questions of the 2004 survey

This appendix lists the questions and their answer options as they appeared in the 2004 survey.

The division of the survey into four parts is also highlighted.

The first part: Writing for a global audience

The questions and their answer options – including the original emphasis in bold text - were:

1. I feel that my company chiefly writes for

5. Domestic audience, but we may translate the manuals to other languages.
6. Audience in another country or countries, but we localize our documentation.
7. Users all over the world. We write chiefly or exclusively in English.
8. I do not have a clear idea whether my audience is international or not.

2. When writing in English, which of the following four sentences describes your company or the company you write for the best:

1. We follow guidelines for writing for international audiences.
2. We have guidelines for writing in English, but they do not contain explicit instructions on writing for international audiences.
3. We do not have guidelines for writing in English.
4. There might be instructions on writing for international audiences, but I am not aware of them.

Questions 3 and 4 explored the recipients' opinions on the validity of the world-ready approach.

3. Writing world-ready product documentation for a lay audience

It is possible to write world-ready product documentation for consumer products (such as TVs, VCRs, mobile phones, cookers) aimed at any kind of audience. As follows, carefully internationalized documentation in English can be enough to instruct the user in safe use of the product. Do you agree?

4. Writing world-ready product documentation for an expert audience

There are products (such as paper machines, telecommunications networks, special medical equipment, or avionics equipment) that are sold worldwide and are likely to be operated only by trained experts. Because the reader base is both narrow and specialized, carefully internationalized documentation in English can be an adequate solution. Do you agree?

Questions three and four were answered on a scale of one to five as outlined below. It was also possible to provide open feedback to both questions. Due to a limitation of the Perl scripts and

the Perl version at the time, it was impossible to match the written feedback to a particular answer given.

1. Completely disagree
2. Somewhat disagree
3. Neither agree nor disagree
4. Somewhat agree
5. Completely agree

The second part: Framework for assessing world-readiness in a product document

The second part of the survey consisted of a summary of the assessment framework and only one question. Question five investigated if the recipients perceived the framework adequate for analyzing the global approach in a technical document. The answer choices were “Yes”, “Partly” and “No”. If the recipient answered “Partly” or “No”, he or she was asked to provide written comments to outline the perceived shortcomings.

The third part: Advice on writing for international audiences

Questions six through 14 were the focus of the survey and examined the recipients’ opinions on the set of instructions provided for writing to international audiences in various books on technical writing. For each of these question five choices on the following scale as well as an option to skip answering were available.

1. Totally disagree
2. Somewhat disagree
3. Neither agree nor disagree
4. Somewhat agree
5. Totally agree
6. Skip this question

The questions were as follows:

1. Short sentences

Various authors recommend using short sentences (ideally ten words or less), because readers who do not speak English as their first language often use a lot of effort simply to understand the individual words in a sentence. Do you agree with this advice?

2. **Simple sentences**

Some authors recommend avoiding complex and compound sentences - even at the expense of sounding choppy. This is because readers who use English as their second or third language can have difficulties understanding the relation between different parts of a complex sentence. Do you agree with this advice?

3. **Avoid learned words**

The general view shared by many authors is that words in English with French, Greek or Latin origins are learned words and should be avoided, because they may or may not be a part of your readers limited vocabulary. Everyday words should be used instead. Do you agree with this advice?

4. **Stick to most commonly used and familiar words**

Several authors recommend that when there is a choice between different synonyms (be they everyday words, learned words or technical terms), the word that is most commonly used in the field or in general language and is therefore the likeliest to be recognized by your reader should always be preferred. Do you agree with this advice?

5. **Rigorous repetition of terms**

Various authors suggest that you should always call the same items by the same name – even if a suitable synonym would make the document livelier. For example, a machine guard should always be called *machine guard* instead of for example a *protective shield* from time to time. Do you agree with this advice?

6. **Verb + preposition combinations should be worked around if possible**

Some authors suggest that people who use English as their second or third language, have trouble with the idiomatic use of verb + preposition combinations.

Examples such as look in, look at, look into, look forward to should be replaced with one word when possible. Do you agree with this advice?

7. **Avoid long, multiword verbs**

Some authors suggest that people who use English as their second or third language, have trouble with verbs where the full meaning has been broken into several words. For example, the expression make a practice of inspecting should be replaced with for example regularly inspect. Do you agree with this advice?

8. **Avoid the passive voice**

Various authors suggest avoiding the use of passive voice in technical documentation, especially to describe something the user should do. This is because passive voice is not constructed the same way in all languages as it is constructed in English. Do you agree with this advice?

9. **Avoid the imperative case**

Some authors instruct against using the imperative case in technical documentation, because audiences in some countries find this offensive. For example, the sentence “Insert the diskette into drive A” could be replaced with “The diskette should be in drive A”. Do you agree with this advice?

The fourth part: Background questions

The final section consisted of four questions that probed the recipients' professional background, level of experience, and the type of company they work for against the answers they had provided. Last, the question on Finnish Technical Communications Society membership was used to calculate the response percentage amongst the FCTS membership. This percentage was in turn used to estimate the overall representativeness of the results.

The questions and their answer choices were:

14. My profession falls best under:

- *Writer* (editor, designer, senior designer, or equivalent)
- *Manager* (line or project). I am not directly involved in writing, or writing is a lesser part of my job.
- *Specialist* (tools, graphics, localization, coordinator, etc.)
- *None of the above*

15. My company's field of business is

5. IT (Information technology) or related (e.g. telecommunications, software, media)
6. Heavy industry/other older forms of industry (e.g. building/constructing machinery or equipment, or other industrial products not associated with information technology)
7. Partner/subcontractor working for IT-industry
8. Partner/subcontractor working for traditional forms of industry

16. I have been working in the field for

- Less than one year
- 1-3 years
- 3-7 years
- Over seven years

17. Member of STD (Suomen tekniset dokumentoijat)²¹

- Yes
- No

²¹ The society has since changed its name to FSTC, Finnish Society for Technical Communicators.

Appendix 3 Questions of the 2017 survey

This appendix describes the questions and the answer choices for each question in the 2017 survey as the questions appeared in parts 2-5 of the survey.

Questions in Part 2: Who do you write for

The second part of the survey consisted of five mandatory questions that explored the availability of technical writing instructions in the companies the recipients worked for and whether the recipient felt that he or she is writing for a global audience or not. The fifth question on the characteristics of a homogenous global expert audience was specifically added in the follow-up survey to probe the validity of the chosen theoretical framework. The questions and their answer options were:

1. I feel that my company chiefly writes for

6. Domestic audience, but we may translate the manuals to other languages.
7. Audience in another country or countries, but we localize our documentation.
8. Users all over the world. We write chiefly or exclusively in English.
9. I do not have a clear idea whether my audience is international or not.

2. When writing in English, which of the following four sentences best describes your company or the company you write for:

1. We follow guidelines for writing for international audiences.
2. We have guidelines for writing in English, but they do not contain explicit instructions on writing for international audiences.
3. We do not have guidelines for writing in English.
4. There might be instructions on writing for international audiences, but I am not aware of them.

Questions 3 -5 explored the recipients' opinions on the validity of the world-ready approach.

3. Writing world-ready product documentation for a lay audience

It is possible to write world-ready product documentation for consumer products (such as TVs, VCRs, mobile phones, cookers) aimed at any kind of audience. As follows, carefully internationalized documentation in English only can be enough to instruct the user in safe use of the product. Do you agree?

4. Writing world-ready product documentation for an expert audience

There are complex technical products (such as paper machines, telecommunications networks, special medical equipment, or avionics equipment) that are sold worldwide and are likely to be operated only by trained experts. Because the reader base is both narrow and specialized, carefully internationalized documentation in English only can be an adequate solution. Do you agree?

5. In your opinion, do global expert audiences exist?

The key enablers for writing product documentation only in English for global use are the shared properties of the audience. If the readers share the same expert knowledge and skills, have passed similar certifications, have roughly equal command of English and work with fairly identical software or machinery, they may not benefit from localized product documentation. Do you agree?

Questions three to five were answered on a scale of one to five as outlined below. It was also possible to provide open feedback to these three questions. Due to the way the

Freeonlinesurveys.com processed the results, it was impossible to match the open feedback with a particular answer given.

1. Completely disagree
2. Somewhat disagree
3. Neither agree nor disagree
4. Somewhat agree
5. Completely agree

Questions in Part 3: Framework for assessing world-readiness in a product document

The third part of the survey contained only one question that investigated if the recipients perceived the framework adequate for analyzing the global approach in a technical document:

“Do you think the [above] framework is comprehensive enough to help in assessing what factors and individual items should be considered when writing for a global, homogenous expert audience?” The question and the answer choices were identical to the 2004 survey. The answer choices were “Yes”, “Partly” and “No”. If the recipient answered “Partly” or “No”, he or she was asked to provide written comments to outline the perceived shortcomings.

Questions in Part 4: Advice on writing for international audiences

Questions 7 through 12 made up the fourth part of the survey. Together with the third part, these questions were the focus of the survey and examined the recipients' opinions on the set of instructions provided in various books on technical writing on writing for global audiences. The advice that was singled out for the study concentrated on word choice and sentence-level questions, such as the use of terminology and verb usage.

The questions in part four were carried out in uniform manner. For each question, five choices on the following scale as well as an option to skip answering were available.

1. Totally disagree
2. Somewhat disagree
3. Neither agree nor disagree
4. Somewhat agree
5. Totally agree
6. Skip this question

The respondents could also provide open feedback to any of the questions at the end of the section. The questions were as follows:

7. Use short and simple sentences

This is because readers who do not speak English as their first language often struggle with complex sentences. Sentences should have no more than ten words, and avoid complex and compound structures even at the expense of sounding choppy. Do you agree with this advice?

8. Favor commonly used and familiar words

When there is a choice between different synonyms, use the word that is most commonly used in the field (e.g. a technical term), or in general language. Avoid French, Latin, or Greek-originating learned words. This is because the common words are the likeliest to be recognized by readers who do not speak English as their first language. Do you agree with this advice?

9. Repeat the terminology rigorously

You should always call the same items by the same name – even if a suitable synonym would make the document livelier. For example, a machine guard should always be called machine guard instead of a protective shield from time to time. Do you agree with this advice?

10. Avoid long, multi-word verb phrases

Some authors suggest that people who use English as their second or third language, have trouble with verb + preposition combinations and with verbs where the meaning has been broken into several words. Examples such as *look at*, *look into*, or the expression *make a practice of inspecting* should be replaced with one word when possible. Do you agree with this advice?

11. Avoid the passive voice

Avoid using the use of passive voice in technical documentation, particularly to describe something the user must do. This is because passive voice is not constructed the same way in all languages as it is constructed in English. Do you agree with this advice?

12. Avoid the imperative case

Even if you write for an international audience, readers in some countries may find the imperative case offending. To counter, the sentence “Plug in the USB cable now.” could be replaced with “The USB cable should now be plugged in.” Do you agree with this advice?

Questions in Part 5: Background questions

The fifth section consisted of three questions that probed the recipients’ professional background, level of experience, and the type of company they work for against the answers they had provided. In the analysis, these questions were used to see if there are variations between for example young, less experienced writers and old seasoned professionals on accepting various advice per face value. These questions were also used to investigate if the respondent’s field of business influenced the perceived availability of technical writing instructions. While the questions themselves were the same as in the 2004 survey, the answer options for each of these three questions were updated to reflect the 13 years of development in the field. The changes are summarized in connection with each question below.

The questions and their answer choices were:

13. My profession falls best under:

- *Writer* (editor, designer, senior designer, or equivalent)
- *Manager* (line or project). I am not directly involved in writing, or writing is a lesser part of my job.
- *Specialist* (tools, graphics, localization, coordinator, etc.)
- A combination of several roles described above (For example, a manager and a writer)
- *None of the above*

An option that combines several roles into one (e.g. a manager and a writer) was added in the 2017 survey to reflect the last ten years of nearshoring and farshoring, and the fact that the remaining employees especially in smaller companies often combine several technical communication roles.

14. My company's field of business is

1. Private sector - IT industry (e.g. telecommunications, software, web, or consumer goods that combine SW and HW, such as fitness bands)
2. Private sector - manufacturing industry (e.g. hardware, machinery, paper, chemistry, consumer goods)
3. Private sector – services
4. Private sector - documentation/localization partner or subcontractor
5. Public sector - education
6. Public sector - government and related activities (e.g. state or municipal agencies, public enterprises)
7. Partner/subcontractor working for traditional forms of industry

The 2004 division between IT industry and “traditional industry” was abandoned in favor of a split between private and public sectors, and a reasonably granular division within each. While this division better represents the division between different fields of public and private sector that was already taking shape in 2004, the change also means that the results of this question will not be comparable between the two surveys.

15. I have been working in the field for

- Less than five (5) years
- Less than ten (10) years
- Less than 15 years
- Less than 20 years
- 20+ years